AMERICAN PRINTING HOUSE
FOR THE BLIND, INC.

Department of Educational and Technical Research

REPORT OF RESEARCH AND DEVELOPMENT ACTIVITIES

Fiscal 1998

HV42
.Am35
D441
1998

1839 Frankfort Avenue • P.O. Box 6085 • Louisville, Kentucky 40206-0085
502-895-2405 • 800-223-1839 • Fax: 502-899-2274 • E-Mail: aph@iglou.com

Mission

The American Printing House for the Blind promotes independence of blind and visually impaired persons by providing special media, tools, and materials needed for education and life.

Table of Contents

Page

Introduction ---- 5

Adult Life ---- 7

Adult Life Projects ---- 9
Self-Help Book–Hearing Aids ---- 10
Self-Help Book–Hearing Loss ---- 11
Induction Loop ---- 12

Art History ---- 13

Art History Through Touch and Sound ---- 15

Braille ---- 17

Braille Language Program ---- 19
Revision of Patterns: The Primary Braille Reading Program ---- 20
Tactile Word Associations ---- 21

Early Childhood ---- 23

Developmental Guidelines for Infants with Visual Impairment: A Manual for Early Intervention ---- 25
On the Way to Literacy III ---- 26
On the Way to Literacy IV ---- 28
Preschool Activity Calendar ---- 29

Educational Games ---- 31

Adaptation of Brain Quest: American History ---- 33
Adaptation of Brain Quest: Science 1000 Questions and Answers ---- 34
Score Card Set ---- 36

Low Vision ---- 37

Bright, Beautiful and Bold Book of Fruits ---- 39
Bright Sights ---- 41
Bold Line Spiral Notebook ---- 42
Individualized Systematic Assessment of Visual Efficiency (ISAVE) ---- 43
Large Print Task Force ---- 44
Low Vision Focus Group ---- 46
MasterPlan Address Book ---- 48
MasterPlan Calendar ---- 49

Magnification Needs to Optimize Reading Efficiency ---- 50
Program to Develop Efficiency in Visual Functioning: Addendum ---- 52
Reading Stand ---- 53
RollBuster I ---- 54

Mathematics ---- 55

Abacus Basic Competency ---- 57
Elementary Math Aids ---- 58
Primary Math Units ---- 60
Print/Braille Protractor ---- 62
Quick Pick Counting and Quick Pick Money ---- 63

Microcomputer Applications and Products ---- 65

APH Speech Environment ---- 67
APH Technology Update ---- 68
Braille' n Speak Scholar ---- 69
IntelliTactiles ---- 70
Listening to Windows 95 ---- 72
Monitoring Technological Developments and Educational Applications ---- 74
Talking Learn Keys ---- 76

Multiple Disabilities ---- 77

Multihandicapped Adolescent Project ---- 79

Science ---- 81

Science Curriculum Adaptation: Animals ---- 83
Science Curriculum Adaptation: Plants ---- 85

Tactile Graphics ---- 87

Basic Science Tactile Graphics ---- 89
Tactile Graphics Research ---- 90
Tactile Graphics Videos ---- 91

Tests and Measurements ---- 93

Directions for Administering the Large Type Version of the Stanford Achievement Series, Ninth Edition, Form S, Complete Battery/Multiple Choice ---- 95
Test Needs ---- 96
National Literary Braille Competency Test ---- 97

Transition ---------- 99

Early Childhood Transition Project ---------- 101
Transition Tote System ---------- 102
Transition Video ---------- 103

Other Activities ---------- 105

Kids Committee ---------- 107
Product Accessibility Committee ---------- 108

Technical Research Report ---------- 111

Technical Research Division: Work During FY 1998 ---------- 113
Technical Research Division: Work Planned for FY 1999 ---------- 118

APH's Department of Educational and Technical Research Staff ---------- 121

Agencies Participating in Research ---------- 123

Consultants ---------- 125

Presentations and Workshops ---------- 133

Publications ---------- 135

Program Materials ---------- 136

New Products ---------- 137

Introduction

The American Printing House for the Blind (APH) has had an ongoing research program for over 45 years. The impetus for APH to establish a research program came when the Committee on Research of the American Association of Instructors of the Blind recognized the need for an effective and stabilized attack on research problems related to education for blind students. APH's Board of Trustees approved such a program at APH's Annual Meeting held in the fall of 1951. The following spring a Research Committee convened. The purpose of the Committee was to investigate and recommend projects in the field of educational research to be undertaken by the APH staff. Marjorie Hooper was appointed to direct the initial work. Her first assignment was to attend regional conferences and visit schools for the blind. She met informally with classroom teachers to learn the most pressing problems that required a research-based solution.

The resulting research program carried on at APH is unique in the field of education. Although the types of research activities undertaken are similar to some of those conducted at colleges and universities, there are a number of decided advantages in having the work done through the Printing House. For example, APH serves the nation as a primary source of educational materials for legally blind students. This means that communication channels are always open between APH's staff and the ultimate consumers of its products and services. Because of this, it is possible to identify specific areas of need. And, because of this, it is possible to use the ultimate consumers, teachers, parents, caregivers, rehabilitation personnel, and blind or visually impaired preschool children, students and adults in the development and evaluation of needed tools and materials.

Other direct advantages in having a research program based at APH are: (a) there is a tremendous amount of expertise, both under the same roof and in the community, always available for consultation; (b) because of APH's many faceted manufacturing capabilities, it is possible to produce and use a wide array of experimental materials; (c) in preparing materials for developmental projects, experimental materials can be developed in close collaboration with production personnel, assuring models will be items that can be translated into products; and (d) successful results of research efforts are reflected in production. Thus, needed materials can be identified, developed, produced, distributed, and used by the preschool children, students and adults who need them.

The spirit of APH's original research committee lives on in APH's research program. Its strength is in its interaction with those in the fields of education and rehabilitation. Many persons give of their time and expertise to cooperate with APH's research projects. Groups with particular expertise are convened to help identify specific needs in a given area and to work with research staff in developing specifications for new materials. Others use and evaluate experimental materials with the population for whom the material is intended. The sections of this report listing agencies that have participated in APH's research program, individuals who have served as consultants on the various projects, and contracted personnel indicate the ongoing and invaluable input received from the field. Only through the outstanding cooperation of persons working in the field has APH's research program been able to thrive and to help parents, teachers, and other professionals in the field solve some of

their most pressing problems by providing needed information and developing special materials designed to meet the unique needs of the blind and visually impaired people they serve.

APH's Board of Trustees and senior management, the Ex Officio Trustees, particularly those who serve as members of the Research and Development Committee and the Publications Committee, consultants in the field and those who have submitted products and product ideas through APH's Product Review committee are commended for their interest and excellent cooperation and commitment to research projects and personnel. Due to the nature of research and product development, every department and division of APH is involved with the research staff. Such involvements are regularly met with a spirit of commitment, openness, and teamwork. These qualities provide an atmosphere for growth and creativity essential to research and the benefits that result from it.

Currently, overall priorities for APH's research program are influenced by the priorities set by the U.S. Department of Education's Office of Special Education and Rehabilitative Services, by Congressional Appropriations Committees, by sales of existing product lines, and by both APH's staff and its Educational Research and Development Committee in response to observed, general needs of the field. Primary areas being addressed include adult life, braille, early childhood, educational games, low vision, microcomputer applications, tactile graphics, tests and assessments, and transition. Work being done in these areas, as well as other activities, are briefly described in this report. For each project, information is given about the project purpose, staff, background, work done during the 1998 fiscal year, and work planned for the next fiscal year.

Adult Life

Digitized by the Internet Archive
in 2013

http://archive.org/details/reportofresearch1998depa

Adult Life Projects (new)

Purpose: To develop products for use by adults

Project staff: Martha Bagley, Project Director

Background. During FY 1998, APH recruited and hired an Adult Life Project Director. The new Project Director, Martha Bagley, began work with APH at the beginning of the last quarter of FY 1998. Ms. Bagley came to APH with a rich background in both research and professional education. Over the past 20 years, she has been involved in basic and evaluative research, preservice and in-service professional education, consumer education, and direct consumer service.

Work during FY 1998. A consultive committee was brought together in August of 1998. Committee members included Dean Tuttle, Carroll Jackson, Priscilla Rogers, Susan Ruzenski, and Karen Wolffe. Their mission was to help APH staff plan a direction for and set first year goals for the new Adult Life Projects. The overall goal for the Adult Life area agreed to by the committee was for APH to develop adult life products and services that are affordable, user-friendly, and consumer-driven and that address the diverse needs of the blind and visually impaired population. This philosophical statement will drive APH Adult Life activities in areas as diverse as product evaluation, development of new products, and electronic information exchange. Specific project ideas were suggested and will be reviewed by a consumer advisory group. These products are drawn from a variety of areas such as activities of daily living, employability, travel, recreation, technology, social and emotional growth, and family needs. A strong emphasis was also placed upon the development of partnerships within the community of people who are blind, the community at large, and the professional disciplines serving people who are blind.

Four new projects were started in late FY 1998: an induction neck loop for use with APH cassette player/recorders, a large print address book, and two self-help books about hearing loss and hearing aids.

Work planned for FY 1999. A consumer advisory group will be formed to set priorities for new product ideas. New product ideas will be solicited from the field and presented to the APH Product Review Committee during FY 1999. Whenever possible these products will be developed cooperatively with other project leaders from Educational Research, creating adult life products in the areas of low vision, braille, tactile graphics, and technology.

Self-Help Book—Hearing Aids (new)

Purpose: To provide information to blind adults who are faced with obtaining and learning to use a hearing aid

Project staff: Martha Bagley, Project Director

Background. Because the incidence of hearing loss increases dramatically with age, blind adults are also at risk of developing a hearing loss later in life. The device most commonly prescribed to compensate for a hearing loss is a hearing aid. While there are other books available about hearing aids and their use, they do not take into consideration that the individual already has a vision loss. This book is intended to identify resources, provide information about obtaining and learning to use hearing aids, and provide basic care guidelines.

Work during FY 1998. This project was presented, reviewed, and approved by APH's Product Review Committee in the last quarter of FY 1998, and work began on the content of the book immediately.

Work planned for FY 1999. The book will be reviewed by appropriate consultants and revised as needed. After completing such preproduction activities as desktop publishing and designing the cover art, the book will be ready for the production phase. It will be produced in both large print and braille. The book is scheduled to be available in the summer of 1999.

Self-Help Book—Hearing Loss (new)

Purpose: To provide information about age-related hearing loss and strategies for coping with that loss to adults who are blind or visually impaired

Project staff: Martha Bagley, Project Director

Background. Because the incidence of hearing loss increases dramatically with age, blind or visually impaired adults are also at risk of developing a hearing loss later in life. This hearing loss could interfere with their ability to communicate and to use coping techniques based on auditory signals. This self-help book on hearing loss is intended to identify resources and to provide information about coping strategies and adaptive devices.

Work during FY 1998. This project was presented, reviewed, and approved by APH's Product Review Committee in the last quarter of FY 1998, and work began on the content of the book immediately.

Work planned for FY 1999. The book will be reviewed by appropriate consultants in the field and revised as needed. After completing such preproduction activities as desktop publishing and designing the cover art, the book will be ready for the production phase. It will be produced in large print and braille and is scheduled to be available in the summer of FY 1999.

Induction Loop (new)

Purpose: To provide direct access to auditory information produced by cassette recorder/players for individuals who are blind and hard-of-hearing

Project Staff: Martha Bagley, Project Director

Background. This product will enable users of APH cassette recorder/players and hearing aids to access auditory information more effectively. An induction neck loop creates an electromagnetic field that hearing-aid users can access through telecoils in their hearing aids. Thus hearing-aid users are able to listen to recorded information through an aid prescribed to match their hearing loss without the interference of background noise. This device can make a great difference in the ability of deaf-blind people to effectively use recorded auditory information.

Work during FY 1998. This project was presented, reviewed, and approved by APH's Product Review Committee in late FY 1998, and work began immediately.

Work planned for FY 1999. Induction neck loops will be offered through APH's catalog as an accessory to the cassette recorder/players.

Art History

Art History Through Touch and Sound (new)

Purpose: To make art history materials available and accessible to legally blind students and adults

Project staff: Fred Otto, Project Director
Jimmie Jackson, Project Assistant
Frank Hayden, Production Assistant/Technical Research

Background. Early in FY 1998, Elisabeth Axel, president of Art Education for the Blind (AEB), began discussions with APH on a collaboration to produce the 22-volume art history audiobook series developed by AEB staff. After 10 years of work, AEB was committed to seeing the series gain widespread exposure and availability to the visually impaired community.

Each volume in the series contains a diagram manual with a print and braille introduction followed by a number of printed reproductions of great art works and tactile graphic representations of each. Packaged with this manual is a set of audiotapes which guide the student through the tactile diagrams and provide historical background through narration and music. Also included is a teacher's guide, which gives a printed and brailled version of the audio narration along with some suggested activities and extensions. These components were field tested continually throughout each volume's development, involving a wide range of evaluators.

Although a final agreement regarding the APH-AEB project has not been reached, APH verbally agreed in August 1998 to produce three volumes from the set—Building Blocks, Ancient Egyptian, and European Modernism—as a trial, and to discuss further production. The European volume will be produced first.

Work during FY 1998. The APH Marketing Department evaluated and discussed the prototype materials and hosted a number of meetings before a project leader was named. Extensive reviews were also performed by Educational Research staff, which led to changes in the format of the diagram manual and the addition of classroom activities.

A large meeting was held in August at which such issues as producing the tactile graphic images, recording and mixing the audiotapes, binding and packaging, and editing the manuals were discussed. Since then, the diagram manual and teacher's guide for European Modernism have been edited by project staff. The text of the diagram manual has also been formatted for large type and prototyped in braille.

Work planned for FY 1999. Assuming a satisfactory agreement between APH and AEB is reached, the initial three volumes will be edited and preproduction will be coordinated for each. As each of the three volumes is produced and made available, reviews of any needed changes will be gathered; these will help shape APH's decisions regarding how to proceed with subsequent volumes in the series.

Braille

Braille Language Program (continuing)

Purpose: To develop a set of beginning language materials consisting of two components, spelling and English, which will minimize problems commonly encountered by beginning braille students in these curricular areas

Project Staff: Eleanor Pester, Project Director
Carol Roderick, Project Assistant
Betty Modaressi, Editor/Consultant

Background. This project was partially funded until December 31, 1989, under a grant awarded to APH by the Federal Research in Education of the Handicapped Program's Field Initiated Research competition administered by the Special Education Programs, Office of Special Education and Rehabilitative Services, U.S. Department of Education. Work began in January of 1985 with an analysis of achievement in language, spelling, and word study skills of 57 blind 4th and 5th graders on a special braille edition of the Stanford Achievement Test, Intermediate 1, Form E, to identify specific problems. A number of spelling and English textbooks and Patterns: The Primary Braille Reading Program were also reviewed before development of the program began.

The program, which is called Patterns: The Primary Braille Spelling and English Program, consists of four levels, A through D. Revisions of the materials based on the field evaluations of approximately 20 teachers working with 50 students across the country proved to be extensive. Level A was prepared for production and made available for purchase during the 1992-93 school year. Level B was put into production and became available for purchase during the 1993-94 school year. Field testing indicated that Levels C and D needed the most extensive revisions, including reorganization of the material and the addition of instructions and practice for writing with slate and stylus. Level C was revised, produced, and became available for the start of the 1996-97 school year.

Work during FY 1998. Production specifications and final editing were completed for Level D. Tooling for print was completed and braille transcription was begun. The skills index was assembled.

Work planned for FY 1999. Braille transcription will be completed. Changes in braille copy will be made in the corresponding print copy. The final proofreading of the braille will be done with the final copy of the print. Production of Level D is scheduled to be completed for the beginning of the 1999-2000 school year.

Revision of Patterns: The Primary Braille Reading Program (new)

Purpose: To revise and update Patterns: The Primary Braille Reading Program

Project Staff: Eleanor Pester, Project Director
Carol Roderick, Project Assistant
Betty Modaressi, Editor/Consultant

Background. Patterns: The Primary Braille Reading Program was designed to teach reading to children who will use braille as their principal reading medium. It was built on strong reading and braille principles and has withstood the test of time since its debut in 1980.

In education, where textbooks over five years old are considered outdated, Patterns is now ancient history. Times have changed, and for some years full inclusion and whole language have been in vogue. Blind children using Patterns are a little out-of- step, and teachers are having a difficult time justifying use of the program.

Young braille readers still, need a firm foundation of beginning braille reading upon which to build. It is the goal of this project to produce an updated and enhanced braille reading program for beginners which will build on the successes of Patterns.

In September 1997, an advisory committee met at the APH to discuss revisions of Patterns: The Primary Braille Reading Program. They decided features that should be kept, features that should be changed, ways to update the content, and topics that would be of interest to today's visually impaired child. The committee discussed current trends in reading for the general population, some new programs and methods for teaching reading and language arts, and the use of tactile graphics with young children.

Work during FY 1998. A detailed timeline and budget were developed for this project. Work on a revised prototype of the early levels of the program ~~were~~ was begun. An extensive bibliography on the latest literature related to braille reading was compiled and reviewed by project personnel. The most helpful trade books on reading were identified; complimentary copies were requested and received from the publishers.

Work planned for FY 1999. Work on developing prototypes for the early levels of the revised Patterns will continue throughout the year.

Tactile Word Associations (redesign) (new)

Purpose: To familiarize young blind children with braille by putting labels on familiar items in their home environments

Project Staff: Eleanor Pester, Project Director

Background. This project is a redesign of a product developed by Lois Harrell. Originally, the product consisted of a set of clear crack-and-peel braille/print labels and a thermoform reference-list booklet with information about the use of the labels printed inside the front and back covers. Through the years, this product had changed so much in the manufacturing process that only the thermoform reference-list booklet remained—without the information on the covers and the crack-and-peel labels.

Work during FY 1998. This product was reviewed in-house where it was deemed worthwhile but in need of both restoration and updating. The project director worked with the product developer on a revision of the word list and information originally printed inside the covers. Plans for the redesign include putting this material in a separate print or braille booklet as the text proper rather than inside the covers. It was also decided that computer-generated simulated (ink-print) braille would be used for the reference list at the back of the print booklet in place of the thermoformed braille reference list. A set of crack-and-peel braille/print labels will once again be included with this product.

Work planned for FY 1999. A timeline for this project will be developed, and revisions and new production specifications will be completed. Tooling will be done for braille and print versions from the disk furnished by the product developer. Production of the item will be scheduled.

Early Childhood

Developmental Guidelines for Infants with Visual Impairment: A Manual for Early Intervention (completed)

Purpose: To develop a manual that presents developmental guidelines for infants from birth to 24 months, who have a wide range of vision loss, in order to assist professionals as they work with families to support the development of these children

Project Staff: Debbie Willis, Project Codirector
Sheri Moore, Project Codirector
Frank Hayden, Production Assistant/Technical Research

Background. The Assessment Scales and Guidelines was submitted by the authors, Dr. Amanda Hall Lueck, Dr. Deborah Chen, and Dr. Linda Kekelis, to APH for possible publication. The scales examine developmental milestones of particular importance to children with vision loss between birth and 2 years of age.

After submission, the materials were reviewed by APH project staff and prepared for review by several expert/content reviewers. Revisions were made based on the evaluators' comments and recommendations.

APH project staff and project authors determined the final format of the manual to best present recent research and intervention methods for infants with visual impairment and incorporate narrative chapters to present specific intervention concerns and development indicators. Summary sheets were prepared for use with individual infants in instructional programs. The summary sheets include specific intervention concerns, a description of developmental behavior, and appropriate daily goals and objectives.

Work during FY 1998. The computer files were provided to APH's Communications Group to complete the desktop publishing activities. The cover art was also created. Production specifications were finalized and the manual entered the production phase. A print version of Developmental Guidelines for Infants with Visual Intervention: A Manual for Early Intervention was produced and made available. Production copies were provided to the project authors for final review and edit.

Development Guidelines was submitted to APH's new Assessibilities Committee. Members of the committee recommended that, in addition to the print version, this product should also be made available on cassette tape.

Work planned for FY 1999. The project as originally planned is completed. Necessary changes reported by the project authors or users of the product will be incorporated into future production runs.

The manual will be reviewed and edited for an auditory presentation. Developmental Guidelines will be recorded and made available on cassette tape during this fiscal year.

On the Way to Literacy III (continuing)

Purpose: To provide additional tactile/visual storybooks that feature text in braille and large print, provide both tactile and visual illustrations, and are designed to be read aloud by an adult to preschoolers who are blind or visually impaired

Project Staff: Suzette Wright, Project Codirector and Author/Consultant
Bob Phelps, Project Codirector/Technical Research
Frank Hayden, Production Assistant/Technical Research

Background. Additional tactile/visual storybooks were requested by evaluators of previous books of this type. The storybooks under development provide text in braille and large print and feature visual and tactile illustrations including a range of tactile graphics from actual objects, to thermoformed objects, to simple raised-line drawings. The storybooks are intended to be read aloud by an adult to preschoolers who are blind or have low vision.

In FY 1997 drafts for seven new storybooks were developed into prototypes. Five copies of each were hand-assembled and distributed for field evaluation. Seven teachers at four sites used the prototype books with twenty-four students from age 2½ years up to kindergarten level. Five of the seven books were highly rated, receiving an excellent rating from a majority of evaluators. Two books, though liked by evaluators, did not rate as highly. (Of the two, difficulties in creating an appropriate raised line for tracking resulted in the elimination of one book from the group. The other book, however, will be revised to add interest and will be retained in the set.) Camera-ready print copy and braille plates were prepared for all books. A list of tasks needed to ready the books for production and the prototypes were provided by the author to members of the APH project team.

Work during FY 1998. A number of preproduction tasks were accomplished during FY 1998. Detailed production specifications and drawings were produced. A wide variety of materials (plastics, fabrics, special paper, custom reclosable pockets, and scented stickers) were sourced and ordered. Final molds for thermoformed illustrations were completed, and camera-ready art for all print illustrations was generated. (Project staff worked with outside printers and APH personnel to determine the most cost-effective method of printing books featuring six or more colors. The investigation has implications for other materials and how final artwork is generated.) Drawings with exact dimensions for necessary dies were made, bids were received, and outside vendors performed die-cut operations required to complete two of the books.

The On the Way to Literacy III set totals five storybooks—two adapted commercially available stories and three original stories. (It was necessary to place one of the books on hold as it contains many sewn items, and the vendor providing this service is no longer in business. An alternative provider at an affordable cost has not been found.) Both the project's new in-house director from Technical Research and the project's original director from Educational Research have worked with the production assistant as each book was prepared for its pilot run. Production of the books was underway at the end of this fiscal year.

Work planned for FY 1999. Project staff and team members from production will continue to work toward completion of each book, preparation of advertising material for the set of books, and completion of pricing and stocking of the new storybooks.

On the Way to Literacy IV (continuing)

Purpose: To continue to provide new titles in the On the Way to Literacy series of tactile/visual storybooks, designed to be read aloud by an adult to preschoolers who are blind or have a significant visual impairment

Project Staff: Suzette Wright, Project Codirector and Author/Consultant
Bob Phelps, Project Codirector/Technical Research

Background. In the spring of 1997, as development of the third set of On the Way to Literacy books was drawing to a close, both the Research and Development Committee and the evaluators of On the Way to Literacy III books recommended continuation of this effort to provide print/braille books with meaningful tactile illustrations for the preschool child. These read-aloud storybooks were first developed as part of a larger project which produced the informational handbook On the Way to Literacy: Early Experiences for Visually Impaired Children. The newest storybooks in the On the Way to Literacy IV set of books will use the format developed for previous books, providing text in braille and large print and featuring a range of visual and tactile illustrations—from actual objects, to thermoformed objects, to simple raised line drawings. (For more information, see write-up of On the Way to Literacy III.)

Work during FY 1998. Development of this newest set of books began late in fiscal year 1998, as the project was planned, budgeted, and approved. The first steps in the project involved a survey of children's books for stories which lend themselves to tactile illustration. Classic children's tales, rhymes, and songs were examined for those suited to tactile illustration; annotated bibliographies of commercial children's books compiled during previous On the Way to Literacy projects were reviewed. A search was made of current children's books. Two original stories were drafted and outlines for two more stories were prepared. The project author discussed the purpose and nature of the books with another author who may submit original stories to be considered for development as tactile/visual storybooks.

Work planned for FY 1999. Final selections will be made of commercial children's books and classic children's stories to develop into tactile/visual storybooks. Original stories will be completed. Tactile/visual illustrations will be designed for all books, and paper drafts of each showing layout of text and illustrations will be prepared. The paper drafts will be distributed to teachers for expert review; their input will determine which drafts are developed into actual prototypes for field evaluation with students. Prototypes will be made of the most promising books and mailed to sites for use by teachers and parents with their students or children. Following the evaluation period, questionnaires completed by the teachers and parents will be examined, results compiled, and books will be revised or eliminated from the set based on the information received.

Preschool Activity Calendar: Print Edition (completed)

Purpose: To develop a 12-month calendar of activities for children of developmental ages 3 to 5 years who are blind, visually impaired, and/or have multiple disabilities

Project Staff: Debbie Willis, Project Codirector
Sheri Moore, Project Codirector
Frank Hayden, Production Assistant

Background. A calendar of daily activity suggestions was developed by Nancy Smith, a preschool teacher/consultant at the Wisconsin School for the Visually Handicapped and Educational Services for the Visually Impaired in Janesville, Wisconsin. The need for easy-to-use ideas for daily activities that stimulate children with visual impairments prompted the initial development of the calendar. After the Wisconsin Department of Public Instruction discontinued circulation of the "Calendar: Everyday Exposure to Experiences for Enjoyment," there was a continuing demand for this item. APH project staff perceived value in a calendar of this nature, with some 365 activity choices for families of young children who are blind or visually impaired.

The purpose of the activities incorporated into the calendar is to encourage the child and caregiver to explore the home and community environment together with inexpensive, practical, concrete activities. The calendar also includes a narrative text with motivational instructional material for caregivers' or parents' use in working with their child. A rationale and suggestions for use are also incorporated into this section. The calendar is designed to be used with the help and support of a vision teacher.

In FY 1997, the early childhood project leader and the calendar author worked collaboratively to make final revisions and modifications to the: Preschool Activity Calendar. Work was completed on several specific areas: identification of the most appropriate target population, general guidelines for use, and an introduction/rationale section to assist professionals and families in making appropriate use of the Calendar.

Work during FY 1998. The project staff met with APH's Product Development Committee regarding production of the calendar, wrote the acknowledgment section, had camera-ready copy prepared, and met with APH's new Product Accessibility Committee regarding the medium in which this product was to be produced. The calendar was then produced on brightly colored paper and made available in a print medium as originally planned. The Product Accessibility Committee, however, recommended that lists of the activities be made available in braille and large print formats.

Work planned for FY 1999. As recommended by APH's Product Accessibility Committee, the Preschool Activity Calendar will be redesigned in such a way that readers of braille and large print will have access to the information presented. It is anticipated the print, large print, and braille versions will each be made available as separate products.

Educational Games

Adaptation of Brain Quest®: American History (new)

Purpose: To provide materials for blind and low vision students that will test and expand their knowledge of American History through use of accessible versions of a popular commercial product that will lead to shared, fun experiences with sighted peers

Project Staff: Karen Poppe, Project Director

Background. The debut of the braille and large type editions of Brain Quest: Science 1000 Questions and Answers led to numerous requests from teachers, parents, students and members of the Research and Development Committee to continue to adapt other editions of the same commercial series. Based upon this positive feedback, the project leader contacted Workman Publishing Company and expressed APH's interest in adapting other editions.

Work during FY 1998. APH received permission from Workman Publishing Company to adapt the following editions of the Brain Quest series into braille and large type formats: American History, Geography, and English. Initial efforts included developing a project timeline for each of the three editions, timelines that forecast the availability of each edition within a short, but realistic time frame.

Work planned for FY 1999. The formats of the large type and braille versions of the three Brain Quest editions (i.e., American History, Geography and English) will be designed to mirror the functional layout of the adapted Science edition. Because the format of the American History edition will be the same as that of the Science edition which was field tested already, it will not be necessary to field test the American History edition. A large print version and a braille/large print combination version will be produced for each edition and score cards will be included in each set as well. (For more information, see the write-up on Adaptation of Brain Quest: Science 1000 Questions and Answers and the write-up on Score Card Set.) Work on producing the Geography and English editions will progress as staff time allows.

Adaptation of Brain Quest®: Science 1000 Questions and Answers (completed)

Purpose: To provide materials for blind and low vision students that will test and expand their knowledge of science through the use of accessible versions of a popular commercial product that will lead to shared, fun experiences with sighted peers

Project Staff: Karen Poppe, Project Director

Background. In the process of reviewing a number of science materials for possible adaptation, Brain Quest: Science 1000 Questions and Answers published by Workman Publishing Company, Inc., was identified as excellent commercially available material that could easily be adapted into braille and large print for use by blind and low vision students in upper elementary and middle school. The questions are appropriate for students in inclusive or residential settings, and the format is fun and motivating. Learning in a game-type fashion can be done with a partner, in teams, or individually.
The project was approved based upon outside requests, expected demand, and need for science-related materials.

In FY 1997, the project leader developed an adapted prototype of Brain Quest: Science 1000 Questions and Answers for field test purposes. The prototype included three versions (a braille-only format, a large print format, and a braille/large print combined format) of the first 10 pages of the first deck in a two deck set. The field testing process was initiated in May and extended through the end of the summer. Evaluative comments from participating field test reviewers were compiled and tabulated, and a final report of the findings was prepared.

Work during FY 1998. Based upon the comments and suggestions from field evaluators, two functional formats of Brain Quest: Science were deemed necessary: a large print version and a large type/braille combination version. Product specifications, edited text files for braille translation, and a camera-ready copy for the large print version were readied by the project leader for production.

In response to student evaluators' requests to make the trivia game more "game-like," the project leader designed a generic, inexpensive tactile score card to provide extra reinforcement for correct answers. Two score cards, one green and one yellow, were included with each Brain Quest: Science edition.

The pilot run of the large print edition was completed by the end of April. The units produced were determined to be of a high quality and served as the full production run of this edition. The pilot run of the large print/braille edition was completed in July of 1998; these units were of expected quality and also satisfied the full production run. Thus, both editions were available ahead of the slated deadline.

Complimentary copies of both adapted editions of Brain Quest: Science were sent to Workman Publishing Company, the publisher of the series. The publisher expressed satisfaction in the quality and design of the adapted versions.

Given the enthusiasm expressed by evaluators, teachers, parents, students, and Research and Development Committee members for the adapted version of Brain Quest: Science, the project leader made efforts to secure copyright permission from Workman Publishing Company, Inc; to produce additional current Brain Quest editions.
Permission was received to make available similar adapted versions of American History, Geography, and English.

Work planned for FY 1999: The formats established for the Brain Quest: Science edition will be used as templates for future adapted editions of the Brain Quest series.

Score Card Set (new/completed)

Purpose: To provide an inexpensive, reusable, and tactile device for students with visual impairments to use during various types of scorekeeping activities

Project Staff: Karen Poppe, Project Director
Tom Poppe, Pattern and Model Maker

Background. The need for a scorekeeping device surfaced during the field test of Brain Quest: Science 1000 Questions and Answers. Some of the students who used the adapted commercial game during the evaluation stage requested that the game be made more "game-like" by including some manipulatives (e.g., game tokens to move on a game board). In an effort to keep the cost of the adapted game within the projected selling cost range, the project leader designed an inexpensive, reusable, and tactile score card that could be included with the Brain Quest edition and be used to record the number of correct answers given by an individual or team. During the development of this device, it became evident that its uses extended beyond the Brain Quest series. Consequently, the device was designed to facilitate numerous scorekeeping, counting, and tallying activities.

Work during FY 1998. The design for the tactile scorekeeping device was developed. Because the "pop-button" feature mimicked that of a design encountered in a previous APH product (i.e., the Baseball Game), it was decided that field testing was not necessary. Attention was given to making the new score card colorful, versatile, and durable. The final design was presented to the Research and Development Committee in October of 1997 and quota approval was received. The committee members encouraged the project leader to think of other products that could incorporate the "pop-button" design.

Tooling for the score card was completed in March of 1998. A brief "Instruction Sheet" explaining the design and uses of the score card was also prepared. Having considered the customer's obvious need for at least two scorekeeping devices (i.e., one for each participating team), one green score card and one yellow score card were paired to create the Score Card Set. The first production run of the Score Card Set was completed in May of 1998. This inexpensive item was packaged with each adapted Brain Quest: Science edition and was also made available as a separate product.

Work planned for FY 1999. No additional work on this product is anticipated.

Low Vision

Bright, Beautiful and Bold Book of Fruits (continuing)

Purpose: To develop books for young children, who have visual impairments, that feature colorful, high-contrast, textured images and a single object on each page with the object's name in large, bold letters and in braille

Project Staff: Elaine Kitchel, Project Director
Suzette Wright, Project Consultant
Lucia Bellafonte, Project Author/Consultant

Background. Although some commercially available children's books feature bright contrasting illustrations, there are few which feature large colorful pictures along with large print and braille. In 1997, Lucia Bellafonte, parent of a child with low vision and a preschool teacher, submitted to APH a book which addresses this need. The sample Bright, Beautiful and Bold Book of Fruits (BBB Book of Fruits) features undetailed illustrations in four color/contrast formats showing single, common objects with the object's name in very large print. The Product Review Committee decided that the book should also contain the object's name in braille and that each object should have a raised, tactually interesting surface. It was also decided that visual discrimination tasks of gradual difficulty should be placed in the book after the fruits are introduced. This allows the parent or teacher to determine, in a general way, whether or not the child can distinguish smaller images and a grouping of images.

Several members of the research staff reviewed the original sample book, responding favorably and suggesting improved fonts for the print, the addition of braille, and the potential value of adding a tactile component to each illustration. Consultants Suze Staugas, preschool teacher of visually impaired children, and Edith Etheridge, of Kentucky School for the Blind, reviewed the book's various formats. The author then developed two more prototypes, incorporating the suggested changes. A Product Development Committee Meeting was held in December by Suzette Wright. Further refinements for the final prototypes for field testing were made. Lucia Bellafonte was then given the responsibility to build the prototypes according to specifications. Elaine Kitchel, who had agreed to work with APH on a consultant basis before joining the Educational Research staff as Low Vision Project Leader, was appointed project leader of the BBB project at the end of 1997.

Work during FY 1998. Artwork was selected with colors for best viewing by children with low vision. Printing options were explored. Binding, cover type, and paper were examined and selected for printing quality as well as ability to sustain tactile images. Print fonts and point size were examined and selected for best viewing by children with low vision. Product specifications and documentation were developed through Product Development Committee meetings, and artwork was obtained from the author and converted to usable form.

The project leader, author, and Project Development Committee finalized details concerning format, font, and tactile graphic media. A formative review of these design deci-

sions by preschool teachers of visually impaired children in both Kentucky and Canada took place before actual prototypes were created.

Twelve sites were selected from New York, Georgia, Arkansas, Texas, Tennessee and other states. A limited number of prototypes were made and sent out to be used with students by teachers and parents as part of the field evaluation for this book.

Work planned for FY 1999. Field testing will continue using children who are visually impaired or blind, and who are of the ages for preschool, kindergarten, or first grade. Evaluations forms will be filled out by educators and parents of the children. Changes will be made to the format, text, and/or art according to the field test results.

Product documentation and specifications will be finalized. The book will be ready to enter the production phase for a pilot run. The BBB Book of Fruits is scheduled to be available at the end of the fiscal year.

Bright Sights (product update) (new)

Purpose: To update the Bright Sights Kit as needed to reflect currently available items and information

Project Staff: Elaine Kitchel, Project Director
Christine Pitzer, Project Consultant
Judy Cernkovic, Project Consultant

Background. Bright Sights was produced in 1984 in response to the need for materials for very young children who have multiple disabilities including impaired vision. While Bright Sights continues to be a popular and useful product, the hex flicker lamp is no longer available, the ultravisor needs re-working, and the black light is no longer included as a component of the kit. For these reasons, the Director of Educational Research assigned the Low Vision Project Leader to work with consultants in the field who could update the information to reflect the items currently included in the kit.

Work during FY 1998. The project leader talked with Suzette Wright to get original background information, met with various APH staff in the Production and Purchasing Departments to learn the production processes which caused the fogging problem with the ultravisor, and to discuss options for alternative material for the ultravisor. The project leader and consultant, Christine Pitzer, then met and reviewed the background and existing kit with its materials, curriculum, and current problems. They discussed alternate polymer choices for the ultravisor, the possibility of including a blacklight flashlight in the kit, the inclusion of other types of colored lights to replace the hex flicker lamp, and some possibilities for a few additional activities which could take place under ordinary light. The project leader and some consultants met again to discuss their findings of alternative materials and to pursue some options for the ultravisor. It was decided that NoIR Medical, who produces goggles for children, should be explored for a possible solution to the ultravisor problem. The new APH Reading Stand being developed and tested will replace the existing heavy birchwood stand that is included in the kit.

Work planned for FY 1999. The project staff plan to solve the problems associated with the current ultravisor and to identify appropriate alternative sources for the blacklight and colored lights. Additional stimulation activities and an updated curriculum will be written. Updating the Bright Sights Kit will be completed by the end of this fiscal year.

Bold Line Spiral Notebook (new)

Purpose: To provide a spiral notebook, similar to the spiral notebooks commonly used by sighted students, for use by students with low vision

Project Staff: Elaine Kitchel, Project Director
Bob Phelps, Production Assistant/Technical Research

Background. APH recognized a need to provide students with low vision the same type of covered, spiral notebook that is commonly used by students who are regular print readers.

Work during FY 1998. APH's Product Review Committee decided to take bold line paper already produced by APH, put it in a spiral binding, and enclose the pages in a brightly colored cover. The committee made decisions about the specifications and selected the cover art. Product specifications for the bold line spiral notebook were completed and this item was prepared to enter the production phase.

Work planned for FY 1999. The bold line spiral notebooks are scheduled to be available early in FY 1999.

Individualized Systematic Assessment of Visual Efficiency (ISAVE) (continuing)

Purpose: To develop an assessment instrument useful to evaluate the potential for visual efficiency of young children, including children with multiple disabilities, in addition to a visual impairment

Project Staff: Elaine Kitchel, Project Codirector
Sheri Moore, Project Codirector
M. Beth Langley, Project Author/Consultant

Background. M. Beth Langley, author of the Functional Vision Inventory, developed an instrument designed to measure potential for visual efficiency in visually impaired children with multiple disabilities. This instrument was originally the "Potential Assessment of Visual Efficiency" (PAVE) and was renamed the "Individualized Assessment of Visual Efficiency" (ISAVE).

ISAVE is a systematic means of formalizing observations of (a) how vision is used, (b) which stimuli elicit residual visual behaviors, (c) the degree of functional intactness of critical visual components, and (d) how residual vision may be facilitated under optimal conditions. The primary purpose of ISAVE is to determine instructional entry-level and programming strategies for facilitating functional application of even the slightest degree of visual functioning. It includes nine areas for evaluation.

Work during FY 1998. The new Low Vision Project Leader reviewed ISAVE in order to become familiar with components, format, content, protocols and add-ons. ISAVE was then edited and reformatted for 14 pt. type and page layout; photos and graphics were prepared from them for card add-ons; product documentation and production specifications were developed through Product Development Committee meetings; the author was contacted for permissions, approvals and ongoing information; the timeline was revised due to the change of Project Director; and the plastic grid add-on and card add-ons were revised.

Work planned for FY 1999. ISAVE is scheduled to be available in the winter of 1999. In order to make ISAVE available in electronic format, it will be converted into HTML or XHTML code and other essential formatting changes of graphics and text will be made.

Large Print Task Force (new)

Purpose: To determine characteristics of large print books that would make them more accessible, manageable and appealing for the end user and to set standards for APH's large print products produced in text and electronic format

Project Staff: Elaine Kitchel, Project Director
Scott Blome, Task Force Member
Will Evans, Task Force Member
Frank Hayden, Task Force Member
Mary Nelle McLennan, Task Force Member
Steve Paris, Task Force Member
Larry Skutchan, Task Force Member
Debbie Willis, Task Force Member

Background. In response to issues raised by teachers and students in the field, the Large Print Task Force was formed and charged with the responsibility of examining APH's process of making large print and making necessary changes in order to meet the needs of the end users. In May of 1998, some Large Print Task Force members met with the Publications Committee. At that time they were given the following directives:

- Conduct research on issues surrounding large print for usability and education validity.
- Pursue electronic book options
- Resolve issues and set standards in clarity and contrast of text and images, point size, font characteristics, leading and density.

Work during FY 1998. The Large Print Task Force met several times. Questions were asked about how to make large print products more useful. A survey was conducted that identified the top nine priorities by end users. Of those, the top four: book size, color content, image quality and text quality were identified. Resource center personnel, teachers and rehabilitation personnel for the visually impaired were interviewed to establish an opinion base. It was suggested that the Task Force conduct a survey of student users. This survey is in the process of being designed.

Production issues arose. An investigation of optical character recognition (OCR) and the hardware and software to enable it as a useful tool to APH was conducted. It was decided that APH needed to establish an experimental OCR workstation to determine whether OCR was a viable option. It was also decided that an intermediate file-formatting station would have to accompany the OCR station. These activities are still in the formation stage. Additionally, the type of software necessary to run the file formatting station is under investigation by the committee.

Print standards from the National Association for the Visually Impaired, Library Reproduction Service, Wisconsin Media Center, among others were obtained. Their products

were then compared to the large print products made by APH. Comparative notes were taken and entered into the record.

In July, the Task Force Project Director met with APH's Product Review Committee and received permission to go ahead with research proposed by Amanda Hall Lueck, Ph.D., which will be instrumental in accomplishing the first directive. For information regarding this research study, see the write-up on Magnification Needs to Optimize Reading Efficiency.

Work planned for FY 1999. The research conducted by Dr. Lueck will be completed in June of 1999. Some important information about print legibility will result from the study. In addition, the Task Force will conduct its own survey of students who use large print, learn their preferences, and be able to extrapolate some useful facts from that survey. Further investigation about optical character recognition, color printing, reduced-size books, text size and font style, paper weight and color, and other issues surrounding legibility will be resolved during this fiscal year. From that information, the Task Force plans to adopt official standards by the end of fiscal year 1999. It is planned that some pilot experiments in producing large print from optical character recognition programming will also occur in fiscal year 1999. Books that result from these pilot experiments will be examined by students and by the Task Force to see whether the books' features meet the Large Print Standards set by the Task Force.

Low Vision Focus Group (new/completed)

Purpose: To help identify needs and to set priorities for research and product development in the area of low vision

Project Staff: Elaine Kitchel, Project Director
Jimmie Jackson, Project Assistant

Background. Until 1998 APH had never had a full-time low vision specialist on staff, but need for a Low-Vision Project Leader was realized as the demand for research and product development in the area of low vision grew. Elaine Kitchel was brought on board as APH's Low Vision Project Leader. Elaine came to APH with a Master's Degree in Special Education for Vision Impairments and 23 years of experience in teaching persons of all ages with low vision and blindness. She had also conducted independent research in low vision. In 1990, Elaine was trained and certified by General Electric in the field of indoor and adaptive lighting, after which she developed an adaptive lighting training program for rehabilitation teachers in Indiana. Her work in light, color, contrast, and typography for persons with low vision is well known.

Work during FY 1998. Since low vision was a new area of endeavor, it was determined that a needs meeting to determine priorities would be held. A group of consultants that included Dr. Natalie Barraga, Christine Pitzer, Dr. Anne Corn, Marilyn Walpole, Dr. Mike Brumit, Marcia Gevers, Edith Etheridge, and Rod Kossick met at APH to participate in the low vision focus group. Also in attendance from APH were: Dr. Tuck Tinsley, Mary Nelle McLennan, Debbie Willis, Steve Paris, Frank Hayden, Bob Phelps, Elaine Kitchel, and Jimmie Jackson.

The first day of the focus group was devoted to the question, "What low vision projects should APH undertake?" Responses of the field experts in order of priority were:

1. Optical devices need to be made more available to students. A kit of optical devices and accompanying materials (curriculum, training video, anti-roll devices) should be developed and made available on quota.

2. Persons with low vision have special space needs that are not yet met by typical ergonomic designs. A workstation for low vision electronic devices should be designed and developed. (This directive was later reviewed by the Research and Development Committee and modified to multiple plans for a workstation for low vision electronic devices should be designed and developed.)

3. There is no quick reference available to convey which APH products are appropriate for specific developmental stages. APH should create and produce a developmental chart with corresponding APH products indicated.

The second day, Marilyn Walpole, consultant from Cincinnati, joined the group and Dr. Brumit exited. On the second day, the group changed their focus from optical aids to large

type. Even strong proponents of optical aids, like Dr. Corn, acknowledged that there is a place for large type. They discussed the question, "How can APH improve its large type products? Responses in order of priority were:

1. Research large print options for usability and educational validity.

2. Pursue electronic book options.

3. APH should develop standards for clarity and contrast of text and images, as well as point size, font, leading, and density.

The participants were very intense, yet lively, and highly invested in the discussions. Drs. Barraga and Corn stated that "this was a monumental event of historical significance." A healthy platform for dialogue between APH and field experts in low vision was established.

Work planned for FY 1998. In FY 1999 the project director will follow-up on performing the tasks and research directions outlined by the 1998 focus group.

MasterPlan Address Book (new)

Purpose: To design and develop a large print address book of non-bleed paper with an easy-to-use format in order to keep addresses, phone numbers, contacts, and applicable notations in an organized manner

Project Staff: Martha Bagley, Project Director
Elaine Kitchel, Project Assistant
Marcia Gevers, Project Designer/Consultant

Background. The MasterPlan Address Book is a product idea that originated with the work of Marcia Gevers, a rehabilitation teacher who observed that her clients needed help organizing addresses, phone numbers, and emergency information. Ms. Gevers conceived the idea of a MasterPlan Address Book to be used with the MasterPlan Calendar she had already designed. The address book is targeted for students and adults who have low vision. It is a large print version of a standard address book with alphabetical tabs in a 3-ring binder. Each entry includes space to record name, address(es), phone number(s) and e-mail address(es). Additional pages may be ordered.

Work during FY 1998. The product idea was presented to the Product Review Committee in July of 1998 and approved with the recommendation that all three products in the MasterPlan series (MasterPlan Calendar, MasterPlan Address Book, and MasterPlan Assignment Keeper) have a similar look and a central theme of growth through independence, accompanied by a user's guide. The address book was designed for inclusion in a 3-ring binder for ease of use. It is the second product in a three-product series. The address book underwent some format revisions by its designer, Marcia Gevers. The project director worked on contract issues and early formatting ideas.

Work planned for FY 1999. The address/phone number book will be completely designed and formatted, and production materials will be selected. Prototypes will be made, an evaluation form will be developed, and field testing utilizing large print readers from middle school, high school, and adult clients/consumers will be conducted. Revisions will be made based on evaluators' comments and suggestions. Revisions are scheduled to be completed by the end of FY 1999.

MasterPlan Calendar (new)

Purpose: To provide a systematic and organized way for students and adults with low vision to keep track of appointments, dates, bills, holidays, and other daily, weekly, or monthly events

Project Staff: Elaine Kitchel, Project Director
Marcia Gevers, Project Designer/Consultant

Background. While working as a rehabilitation teacher, Marcia Gevers became aware of the need for her clients to have a way to organize their bills and monthly reminders and to notate their appointments. Ms. Gevers conceived of and designed the MasterPlan Calendar to fill that need. It is a 3-ring calendar in a binder targeted for students and adults who have low vision. Each page enumerates and holds space for three days of the month, with enough room to write notes and appointment times. Each month-at-a-glance page is preceded by a colorful pocket folder that can hold invoices and receipts for each month. Additionally, a cover page for each month details in large print the holidays and special events for that month.

Work during FY 1998. The project leader met with APH's Product Review Committee to discuss the potential of the project. After receiving approval from the Product Review Committee, the project leader presented the product idea to APH's Executive Committee as specified by the steps detailed on the timeline. With positive responses received from both committees, the project leader met with the project designer and the APH production assistant to select tabs, cover art, papers, ink, type size and font for best viewing by people with low vision. An appropriate binder was selected, and an initial name was proposed to APH's Product Name Committee. Because the project designer had successfully used such a calendar for several years, it was decided that field testing would not be necessary. The plan is to sell the calendar in a 3-ring binder with replacement calendars available in the future.

Work planned for FY 1999. The project leader will work with production staff on the initial run of this item. It is scheduled to be available early in FY 1999 and will be revised each year as needed for annual production. The project leader will gather comments from users of the calendar and make revisions if needed for future runs.

Magnification Needs to Optimize Reading Efficiency (new)

Purpose: To determine optical magnification requirements of students with low vision and optimal methods to promote reading efficiency of students with low vision

Project Staff: Elaine Kitchel, Project Codirector
Amanda Hall Lueck, Project Codirector/Consultant

Background. In May of 1998, the Low Vision Project Leader met with a Focus Group and with the Research and Development Committee. Both groups issued the directives:

- Make available optical devices, accompanying materials, and accessories.
- Provide a curriculum for the use of optical devices.
- Produce a video for optical device training.

Before any of the directives can be accomplished, groundwork research must be conducted. A research proposal, Magnification Needs to Optimize Reading Efficiency for Students with Low Vision, was submitted to APH by Dr. Amanda Hall Lueck of San Francisco State University and was approved in July 1998 as a collaborative project to pursue.

Work during FY 1998. After considerable dialogue in preparation for the proposed research, the two project codirectors met in July 1998 to review the research proposal and budget. It was determined that the results of Dr. Lueck's research would provide necessary information about optical magnification requirements of students with low vision and would help determine optimal methods to promote reading efficiency in students with low vision. This information is essential to the formation of a curriculum which would teach the use of optical magnification devices for reading. Acquisition of magnifiers and monoculars for the purpose of testing and evaluating them for inclusion in the curriculum was begun.

Work planned for FY 1999. The formal research study will take place during FY 1999. It will yield results regarding the following questions:

- What are the relationships between a student's reading acuity, reading efficiency, or reading speed and his or her preferred print size for reading?
- Given information about reading acuity, print size preference, and other visual characteristics, what is the most appropriate method of magnification for a particular student with low vision?
- What optical devices are most appropriate for text-reading tasks, and what methods can be used to determine the proper prescription for them?

Field testing will be conducted in the San Francisco Bay area by Dr. Amanda Hall Lueck and her colleagues.

The study will be broken into three parts:

- Part One: Testing of twenty 4th-grade students with normal vision to determine baselines for the inter-relationship between print size and reading efficiency.

- Part Two: Testing of twenty 4th-grade students with low vision to compare with baseline studies. This portion will provide guidelines to determine optimum magnification for reading for low vision students. It will indicate the extent to which efficiency is impaired if print is less than optimal in size.

- Part three: Testing of ten 7th-grade students with low vision who are fluent readers to obtain samples of their reading speeds using three to four different magnifiers providing different levels of magnification. This will yield recommendations for a collection of low vision optical devices to be included in the APH inventory for customizing the Optical Devices Kit.

Throughout FY 1999, the project codirectors and other members of the research team will continue to discuss the progress of the research and its preliminary results. The results will be compiled, and a final report will be written by Dr. Lueck and made available by the end of the fiscal year.

Program to Develop Efficiency in Visual Functioning: Addendum (completed)

Purpose: To provide materials for the development of visual functioning for children who have handicapping conditions in addition to low vision

Project Staff: June Morris, Project Codirector/Consultant
Bob Phelps, Project Codirector/Technical Research
Natalie Barraga, Project Author/Consultant
Janice Stallings, Project Consultant

Background. The Program to Develop Efficiency in Visual Functioning was published in the early 1980s. When this program was written, the target population was children whose primary handicapping condition was low vision. Since that time, APH has been serving more children with multiple disabilities. This project was undertaken to provide materials for this population. Materials planned included an update of the resource guide, additional lessons, and information for instruction for learners with developmental delays.

Dr. Natalie Barraga drafted (a) new and revised sections of the Source Book on Low Vision, (b) new Volume II, Design for Instructions for Learners with Developmental Delays, and (c) fifty-five new lessons for use with the targeted population. The three revised/new components of the program were sent out for review.

Work during FY 1998. Refinements on the new/revised components were made as indicated by results of the field review. Some changes were extensive, requiring additional review and editing by June Morris. Technical Research staff completed the final changes during the second quarter of FY 1998. The components of the program were then readied for production. New electronic files were developed for the production of the component parts. Production specifications were completed and the Addendum entered the production phase. The project was completed as planned. The new and revised components were made available as a set so that they can be added to existing programs and included with future production runs of the Program to Develop Efficiency in Visual Functioning.

Work planned for FY 1999. Unless suggestions from the field are received that require changes to the Addendum, no additional work is planned for FY 1999.

Reading Stand (new)

Purpose: To design and produce an inexpensive, attractive, lightweight, waterproof, compact, adjustable, durable, functional, easy-to-use reading stand for legally blind students and adults who need large books held at different upright positions for convenient and comfortable reading

Project Staff: Elaine Kitchel, Project Director
Tom Poppe, Pattern and Model Maker

Background. A practitioner in the field of low vision, Nancy Rinker, sent a reading stand to APH which she had designed and built out of cardboard. The attraction of this particular reading stand was that it was lightweight and had multiple levels for holding the reading material.

Work during FY 1998. The submission of the cardboard reading stand planted the seed necessary for APH's Product Review Committee to begin to discuss the idea of redesigning the Rinker Stand. The Model Maker was given the task of designing a reading stand that would incorporate the best of the Rinker Reading Stand along with the desired qualities of being water resistant, attractive, durable, lightweight, compact, easy-to-use, and inexpensive. The Model Maker was successful in conceiving of and designing a reading stand that incorporated all the desired features. Prototypes were built, an evaluation form was developed, and appropriate reviewers were identified for field testing which is scheduled to begin in September.

Work planned for FY 1999. Field test results will be compiled and analyzed. Revisions to the product will be made based on reviewers' comments and suggestions. Product Development Committee Meetings will be held to finalize the specifications, guidelines, materials, and processes needed to produce the reading stand. A final name for the stand will be determined. It is anticipated that the reading stand will be available by the end of FY 1999.

RollBuster I (new)

Purpose: To develop a product for use with a monocular that keeps the monocular from rolling off a desk, table, or podium and offers some impact protection if dropped on its side

Project Staff: Elaine Kitchel, Project Director
Tom Poppe, Pattern and Model Maker

Background. RollBuster I is a cushiony, stretchable, shock absorbent polymer in the form of a central ring with a 3- or 4-sided outside edge. It slips on the monocular like a ring. It was designed to fill a need expressed by teachers, rehabilitation instructors, optometrists, and monocular users.

Work During FY 1998. The product idea was submitted to APH's Product Review Committee and approved. The concept of the non-skid ring evolved and a few rudimentary prototypes were produced and tested. The rings showed tolerances to resist the following inclines:

3-sided ring 49 degrees
4-sided ring 42 degrees
6-sided ring 29 degrees.

The rings of gum rubber resisted more incline than those of neoprene or Microsorb but showed some cosmetic problems with the compression of die cutting. A suitable polymer was not located this fiscal year.

Work planned for FY 1999. Research into the most common sizes of monoculars has shown that RollBuster I will be needed in at least three different diameters. Designs will be drawn up to determine what outer shape best fits with each diameter. Appropriate materials will continue to be tested until the most suitable one is found. At that time, prototypes will be made and field testing will be conducted. Modifications will be made based on the field-test results. Plans are to have the RollBuster I available by the middle of FY 1999.

Additionally, a cradle-type of RollBuster for use by young students was proposed by the Low Vision Focus Group. Designs will be made for this second RollBuster which will have the working name of RollBuster II. Development of RollBuster II is expected to be underway during the last half of FY 1999.

Mathematics

Abacus Basic Competency (new)

Purpose: To produce instructional materials that teach use of the Cranmer Abacus by a simple counting method

Project Staff: Eleanor Pester, Project Director

Background. In July of 1997, Susan Millaway submitted to APH's Product Review Committee for production consideration a book that she had authored. The book, Abacus Basic Competency, teaches use of the Cranmer Abacus by a simple counting method. It was reviewed by three APH staff members who have abacus experience.

Work during FY 1998. A report on the in-house reviews was made to the Product Review Committee, who suggested that some consultants in the field review the book. Braille and print copies were prepared and sent to teachers in Kentucky, Pennsylvania, and Michigan for review. The decision was unanimous that the book be published. An agreement concerning publication of the book was finalized and initial preparations for production were begun.

Work planned for FY 1999. Production specifications will be finalized. The book will be tooled for braille and print production, then scheduled for pilot and production runs.

Elementary Math Aids (continuing)

Purpose: To develop materials to aid visually impaired users in developing understanding of and competence in elementary mathematics

Project Staff: Eleanor Pester, Project Director
Karen Poppe, Project Assistant
Carol Roderick, Project Assistant
Tom Poppe, Pattern and Model Maker

Background. In an effort to identify specific needs of visually impaired students in the area of math, teachers from the elementary and itinerant divisions of the Association for the Education and Rehabilitation of the Blind and Visually Impaired (AER) were surveyed. Also, an advisory committee met at APH to focus on the needs of young braille users in elementary math, to set priorities for the development of materials, and to determine specifications for the materials to be developed. (For additional information, see the write-up on Primary Math Units.)

Based on the survey and committee recommendations, prototypes of the following stand-alone elementary math aids were developed:

1. Beginner's Abacus and Beginner's Abacus Guidebook
2. Analog Clock Model (with minute indicators)
3. Digital Clock Model
4. Nemeth Code Reference Sheets
5. Number/Fact Cards with an Organizational Card Chart
6. Numbered and Blank Hundreds Boards with Manipulatives
7. Math Fact Drill Sheets with a Slotted Self-Checking Holder
8. Video Program on Using the Abacus for Computation (script)

In FY 1996, the aids were field tested and the script for the video program was reviewed. Based on the field test results, the first four aids listed above were prepared for production; the next two aids needed extensive revisions and retesting. The next aid, Math Fact Drill Sheets with a Slotted Self-Checking Holder, was discontinued and, instead, permission was sought to produce a braille/print version of Poke and Pull card sets covering the math facts. The script for the abacus video program was revised for production.

In FY 1997, the Beginner's Abacus, Analog Clock Model, Digital Clock Model, and Nemeth Code Reference Sheet were ready for production. Revised prototypes of the Card Chart and Hundred Boards were developed, field tested with a few students, and prepared for production. Permission to produce Poke and Pull card sets was secured. The abacus training video program, "Hands-On Experience with the Cranmer Abacus," was produced and made available.

Work during FY 1998. Production was completed on the Beginner's Abacus, Analog Clock Model, Nemeth Code Reference Sheet, Card Chart and Drill Cards, and Hundred Boards. These products were then made available. The Digital Clock Model was put on hold until tooling can be done for a more reasonable price. Poke and Pull was sent out for review with positive results, renamed Quick Pick, and then tooled for production.

Work planned for FY 1999. Efforts will be made to complete production of the four sets of Quick Pick that cover the basic math facts and the Digital Clock Model, completing the eight suggested stand-alone math aids.

Primary Math Units (continuing)

Purpose: To develop instructional math materials to use with blind or visually impaired students in the primary grades as either a supplement to the classroom math program or as a core curriculum

Project Staff: Eleanor Pester, Project Director
Carol Roderick, Project Assistant
Karen Poppe, Project Assistant
Betty Modaressi, Project Author/Consultant

Background. Math achievement of blind students has consistently been behind that of their sighted peers. In recent years, very little research and product development have been done to improve this situation. Teachers of students who are blind, however, have continuously requested special braille curricular materials for math similar to those in the Patterns programs developed at APH to teach braille reading. Because of the dramatic increases in the number of blind students mainstreamed and use of the itinerant special education teacher model, the math priority stated in GOALS 2000, and new teaching standards recently adopted by the National Council of Teachers of Mathematics, it was appropriate to focus once again on math materials for visually impaired students. This project received special funding as part of a three-year research initiative to develop new products in math, science, and geography. (For additional information, see the write-up on Elementary Math Aids.)

During the Math Needs Advisory Committee Meeting in September 1994, this program was discussed and specifications were determined. Other work on the project included a review of the research and literature on math instruction for visually impaired students; analyses of math curriculum guides; a thorough analyses of current textbooks to determine mathematical symbols, terms, and concepts being taught; a search of the catalogs for commercially available math related products; and a review of programs on abacus instruction.

By 1996, prototypes of eight Primary Math Units and a general guidebook began to take shape with guidance from Dr. William E. Leibfritz, math consultant. In July 1996, a group of teachers of the visually impaired met at APH to share ideas they found to be particularly effective for developing math concepts and providing practice materials for their visually impaired primary students. These ideas were incorporated into the strategies for the math program. Because work on the Primary Math Units proved to be more extensive than originally thought, work continued on the materials and field testing was postponed. In July 1997, project consultants met at APH and reviewed the teaching strategies for the Primary Math Units in detail.

Work during FY 1998. The Primary Math Units were completed and worksheets were developed to supplement the units. During this time, appropriate field testers were identified.

Work planned for FY 1999. The Primary Math Units and accompanying worksheets will be prepared and field tested by teachers of approximately 20 blind and/or visually impaired students in kindergarten through third grade for use during the 1998-1999 school year.

Print/Braille Protractor (new/completed)

Purpose: To produce a teaching tool for legally blind students that is used to promote understanding of measurement of angles on both two-dimensional surfaces and solid objects

Project Staff: Tom Poppe, Project Director/Model Maker

Background. Nancy Osterhaus, a teacher of the blind and visually impaired in the state of Texas, reported having successfully used a protractor that measures angles on two-dimensional surfaces and solid objects (technically, a goniometer) with her blind and visually impaired students for over 18 years. Her experience was that this design was extremely helpful in teaching her students to use the protractor to measure and read angles as accurately as her sighted students.

Work during FY 1998. The idea for APH to offer the print/braille protractor was submitted to APH's Product Review Committee and was approved. The manufacturer of the original protractor used by Nancy Osterhaus 20 years ago was located. The same style protractor, which is made of an embossable plastic, was still being produced. Since this particular type of protractor was still available, it was decided to purchase the protractors rather than try to make them in-house.

Several prototype print/braille protractors were made and pilot tested with some students at the Kentucky School for the Blind. Following this, decisions were made regarding the best way to hold the pointer on and the best pointer design. After these were determined, a die was made to emboss the braille dots in production. A brief description and direction sheet was written by Nancy Osterhaus, duplicated in large print and braille, and packaged with the protractor.

The first production run of 250 units was completed and made available.

Work planned for FY 1999. Unless revisions are indicated by the field, no additional work is planned for the print/braille protractor in FY 1999.

Quick Pick Counting and Quick Pick Money (formerly Poke and Pull) (new)

Purpose: To explore the effectiveness of using sets of Quick Pick Counting and Quick Pick Money with blind and visually impaired students

Project Staff: Eleanor Pester, Project Director
Carol Roderick, Project Assistant

Background. As part of the Elementary Math Aids project, the Math Fact Drill Sheets with a Slotted Self-Checking Holder was discontinued and, instead, permission was sought to produce a braille/print version of Poke and Pull card sets covering the basic math facts. The product series was renamed Quick Pick.

Work during FY 1998. During the development of Quick Pick Addition, Quick Pick Subtraction, Quick Pick Multiplication, and Quick Pick Division, the possibility of developing other sets of Quick Pick materials was considered. (For more information, see the write-up on Elementary Math Aids pertaining to Poke and Pull.)

One promising set of Quick Pick materials, Quick Pick Counting, can be used to introduce counting with tactile illustrations. This is an important step which should directly follow having the student count real, concrete objects. For the tactual learner, however, this step is often omitted. Since illustrations used in textbooks can be very difficult to interpret tactually, the early levels of the textbooks are often not produced in tactile format at all.

Another promising set of Quick Pick materials, Quick Pick Money, can be used for coin identification and counting. Inexpensive, accessible materials which provide such practice may not be readily available. Since identifying and handling money are important life skills, this set of materials will be researched as to its importance and effectiveness in reinforcing the skills mentioned.

Work planned for FY 1999. If the need for these materials is confirmed, prototypes of Quick Pick Counting and Quick Pick Money (coins) will be developed, prepared for field testing, and field tested.

Microcomputer Applications and Products

APH Speech Environment (new)

Purpose: To develop a reusable foundation for current talking software from APH

Project Staff: Larry Skutchan, Project Director
Rob Meredith, Programmer

Background. APH is beginning to develop a new generation of talking software that runs under Windows. While each completed title will be different, they will all have much in common. For example, each program will need to speak and offer the user the opportunity to change voices and speaking rates. Each program will also need to take advantage of Microsoft's Active Accessibility (MSAA), a method for interrogating objects on the screen in Windows. The APH Speech Environment (ASE) is a program module which provides these core services. While it will not be a stand-alone product, it will be included as part of most APH software developed for Windows.

Work during FY 1998. Initial program specification were developed, and coding was started. A test shell was also developed, which permits testing of the program routines before including them in real applications.

Work planned for FY 1999. The programming team will continue to develop ASE and will include it in completed software titles. While the basic foundation will be completed this fiscal year, it is expected that ASE will constantly evolve as the need for more functionality presents itself.

APH Technology Update (formerly accessAbilitiles) (series)

Purpose: To provide current information on assistive technology and related issues to people with visual impairments

Project Staff: Larry Skutchan, Project Director
Rob Meredith, Project Assistant
John Hedges, Project Assistant
Jimmie Jackson, Project Assistant

Background. Technology Update (T-UP) evolved from a handout provided to attendees at a 1985 Summer Training Session at APH. The Ninth Microcomputer Advisory Committee, along with professionals in the field, requested that the publication become a permanent newsletter providing ongoing information on access technology for those with visual impairments. Since its inception, the publication has evolved from a simple, printed handout to a publication available in large print, braille, cassette, IBM disk text files, and HTML on the APH website.

The content of the publication includes articles covering such topics as new APH technology products, family focus, user tips, and exploration of new assistive technology. The copy for each issue is provided to the Communications Group in Advisory Services for desktop publishing and preparation in the various accessible media. The final draft is reviewed by project staff prior to publication.

Work during FY 1998. The accessAbilities newsletter continued to be provided as a free service to the visually impaired community and those who serve them. A Fall 1997 issue was prepared and distributed early in 1998.

The new Technology Project Director submitted a name change to the Product Name Committee. The newsletter was renamed Technology Update (T-UP). Articles were drafted for the Fall 1998 issue, and copy was turned over to the Communications Group on July 1, 1998. Topics covered in this issue included: using DOS in the late 90s, frequently asked questions, serial communications, welcome back Larry, Reader's Digest–Braille Edition, Microsoft Active Accessibility, guidelines to fonts for low vision readers, and the Listening To Windows 95 training kit.

Work planned for FY 1999. A Fall 1999 school year issue of Technology Update is planned. As time permits, Web supplements to T-UP will be published, including an access "Tip of the Month."

Braille 'n Speak Scholar (new)

Purpose: To provide an inexpensive electronic note taker geared toward blind and visually impaired school-age users

Project Staff: Bob Phelps, Project Codirector
Larry Skutchan, Project Codirector
Rob Meredith, Project Assistant
James Robinson, Project Assistant
Fred Gissoni, Project Assistant

Background. In 1994, as part of a cooperative effort with Blazie Engineering, Inc., APH began distributing a specialized version of the Braille 'n Speak Classic which was less expensive than the original version and that contained more software geared toward school age users. As the original hardware evolved, APH's version also changed to incorporate new technology and make the software as friendly as possible.

Work during FY 1998. APH developed the specifications for what features that should be included as standard on the next generation of Braille 'n Speak Scholar technology which is based on Blazie Engineering's Braille 'n Speak 2000 (BNS 2000). This included the graphing calculator known as Graph-It, a built-in spell checker, and a cable to connect directly to the PC. Some other software features of the BNS 2000 were also removed to make room for the specialized software and some hardware was removed to reduce the price.

APH staff extensively tested the new software and developed documentation to describe the new features.

Work Planned for FY 99. The software will be finalized and documentation completed. The unit is scheduled to be available in January 1999.

IntelliTactiles (formerly IntelliKeys Research) (continuing)

Purpose: To develop educational activities and companion tactile overlays for use with the IntelliKeys adaptive keyboard

Project Staff: Larry Skutchan, Project Director
Jimmie Jackson, Project Assistant
Karen Poppe, Project Assistant
John Hedges, Project Assistant
Frank Hayden, Production Assistant

Background. IntelliKeys is a commercially available keyboard for use with Macintosh, IBM-compatible, and Apple II platforms. The keyboard comes with eight standard overlays for customized settings (including switch control) that feature alternative keyboard designs, simplified keyboard arrangements, high contrast colors and large keys.

IntelliTools authoring software enables nonprogrammers to create their own lessons incorporating speech, sound, and animation. When combined with tactile overlays, the speech and sound components make the educational activities accessible to blind and visually impaired students.

Work during FY 1998. Because IntelliKeys is a trademark name, the working name for this project is now IntelliTactiles, a generic name that describes the type of adaptive keyboard overlays the project team aims to research and develop. Work on this project had been put "on hold" due to the need for a project leader. Work on the project resumed in June of 1998. The IntelliTactiles team reviewed files of the former project leader to determine what had been accomplished already. The team also hosted a presentation and attended a training seminar by the director of the Braille Access Center at Washington State School for the Blind and trainer for IntelliTools.

Upgraded IntelliTools authoring software for the Windows platform was purchased and manuals for both the software and the IntelliKeys keyboard were reviewed. The team also ordered commercial educational software that met curriculum needs defined by the APH national survey conducted for this project and explored the possibilities of making the commercial software accessible. Initial research revealed problems with adapting commercial software for accessibility and retaining valid learning objectives for blind and visually impaired students.

Team members in the Educational Research Department identified APH educational products that would be enhanced by companion tactile overlays and the types of learning activities appropriate for those products. The project team selected three for immediate consideration: Tactile Treasures, Sense of Science, and the revised Patterns. The team began a review of Tactile Treasures to determine which lesson objectives match target curriculum needs and which tactile pages provide keyboard content.

In order to identify durable and flexible materials appropriate for IntelliKeys keyboard overlays, the team examined different types of ribbed vinyl sheets suitable for making transparent, graphic, tactile and braille overlays.

Work planned for FY 1999. While the project team will continue to explore parameters for adapting commercial software and retaining valid learning objectives for blind and visually impaired students, the primary focus will be to develop companion activities and overlays for educational products produced by APH. The initial focus will be to continue research and development of comprehensive learning objectives, software for learning activities and tactile overlays for Tactile Treasures. In addition, research will include the possibility of designing adaptive overlays to meet target needs for students with multiple disabilities who are visually impaired or blind.

The project team plans to explore creating software components to augment the IntelliTools authoring software, importing sound and speech recordings, and programming learning activities that require adaptive overlays. The project goal is to create activities based on valid learning objectives that are fun, engaging, age-and ability-appropriate, inclusive (when possible), and accessible.

Listening to Windows 95 (continuing)

Purpose: To collaborate with TecSo Incorporated of Montreal (Canada) in the development of innovative Windows 95 training tools for blind and visually impaired students and adults

Project Staff: Debbie Willis, Project Codirector
Rob Meredith, Project Codirector
Larry Skutchan, Project Codirector
John Hedges, Project Assistant
Karen Poppe, Project Assistant
Ann Jarry, TecSo Project Director
Chantal Disney, Translation Consultant
Patrick Chasse, TecSo Programmer

Background. In February 1997, APH and TecSo Incorporated (Technology and Society) established a collaborative effort to develop and field test innovative Windows training tools.

TecSo staff created the initial project content that included an interactive CD-ROM based tutorial, an adapted mouse, tactile graphics of Windows 95 screens, and a screen concepts modeling board. For its part of the effort, APH evaluated the materials, translated the content and concepts from French to English, rewrote and recorded the script, and field tested the materials. APH also produced French prototypes for TecSo's field testing purposes and designed key Windows 95-concept tactile screen representations. APH project staff determined the simulated mouse hardware proved too unreliable to be included as part of the kit, so that section and its accompanying unit in the tutorial were eliminated.

TecSo staff tested the materials with blind and visually impaired college students and adults in French-speaking Canada, while APH piloted use of the materials by middle school and high school students in the USA.

Work during FY 1998. Working with the students from the Kentucky School for the Blind, APH conducted a small pilot test of the CD-ROM based tutorial and its components while revisions were made to the software at TecSo. APH then identified 14 geographically diverse educational settings where field testing could be performed and contacted these sites to determine their need and interest.

Once the software was revised according to results gathered during pilot testing, field testing began. The tutorial was field tested with nine students from the 7th through 11th grades in Georgia, Massachusetts, New York, Tennessee, and Utah. Five students were in non-residential school settings; the remaining four were in residential schools. APH evaluated the field-test results and provided those to TecSo for further software revisions and error corrections. Field test results also indicated minor packaging problems that result in making scratches on the CD. APH revised the packaging to prevent this problem. The final product was named Listening to Windows 95.

Work planned for FY 1999. Product specifications will be written and finalized. Listening to Windows 95, which consists of a CD, 14 tactile screen representations available in raised line/braille and print media, and a manual provided in print, braille, on cassette, and on the CD, will be housed in a 3-ring binder. This product will enter the production phase and be made available in FY 1999.

Negotiations will continue with TecSo and a cost analysis will be done at APH to determine whether APH will pursue availability of the screen concepts modeling board that includes various sizes and shapes of braille and large print labels. If produced, it will be made available as a separate product.

Monitoring Technological Developments and Educational Applications (ongoing)

Purpose: To identify and develop microcomputer materials which support educational needs, to monitor technological developments and educational applications of technology, and to disseminate information on current uses of technological aids

Project Staff: Larry Skutchan, Project Director
Rob Meredith, Programmer I
John Hedges, Programmer II
Jimmie Jackson, Project Assistant

Background. The rapid advances in use and development of software, hardware, accessibility considerations, and educational theories require significant attention. The technology group in the Educational Research Department monitors and participates in numerous activities to keep abreast of developing trends and current implementations and encourages trends, policies, and standards that use technology to promote APH's mission.

The technology group keeps informed through participation in listserves like gui-talk, java-access, and scantalk. It actively uses and beta tests pre-releases of operating system code, key applications, Active Accessibility, Java Swing Components, and screen enlargement and speech or braille output accessibility aids. The group attends conferences, presents products and activities, and demos APH products related to technology.

In its efforts to influence direction, the technology group creates software both for internal research and use and as direct products, applies expertise to help make APH effective and accessible in its production of braille and large print and its application of new and emerging technologies to these processes, and disseminates information to APH and directly to users. The group promotes accessibility within APH by establishing techniques that make the entire company accessible.

These ongoing endeavors help keep APH personnel knowledgeable and influential in the areas of regular and assistive technology.

Work during FY 1998. An in-house group participated in a language processing activity lead by Tuck Tinsley to determine what APH's needs were in the area of technology. The top priority was that APH needs a Technology Project Leader. This position was filled by Larry Skutchan on April 22, 1998. Larry's background and experience includes a previous 9-year stint at APH writing educational software and experience as the author of several software packages for his own company.

Under the leadership of Larry Skutchan, the technology group continued to participate in beta testing, monitoring listserves, attending conferences, collaborating with other developers, and disseminating information. As one of the early steps to making APH a model for accessibility, the group established APH's internal Electronic Forms Committee, a subcommittee of APH's new Accessibilities Committee. It also began a study of effective means

of combining APH's large print and braille areas to accommodate digital text and digital talking books. The group attended Product Review Committee sessions and advised about technological products being evaluated, helped to insure the accessibility of APH's website and online ordering systems, and participated in the effort to modernize APH's recording studios.

Work planned for FY 1999. The technology group will establish itself in the forefront of digital document access; insure critical system components and emerging systems; maintain and improve accessibility; and develop high quality, educationally sound software solutions for blind and visually impaired students. One package under consideration will serve both as a platform on which to build other courseware and as a vehicle to deliver digital documents. Such development enables the software engineers to rapidly add new elements as standards are designed, proposed, and adopted.

The technology group will continue to pursue ways of applying technology to the production of tactile graphics, help educate other project leaders in the Department of Educational Research, and look for ways to use technological solutions to further the department's goals. The technology group will also be instrumental in upgrading the Department of Educational Research's hardware and software to give the project leaders effective tools as well as access to tools developed by the technology group.

Talking Learn Keys (new)

Purpose: To provide a Windows-based basic keyboard training software for visually impaired or blind users to become familiar with any computer keyboard or to hear keystrokes announced in applications

Project Staff: Larry Skutchan, Project Director
John Hedges, Project Programmer
Rob Meredith, Project Assistant

Background. Talking Learn Keys will provide clearly recorded audio feedback about keys that any age user types on the PC keyboard. It can be used in two configurations. In the first, the user can type any key on the keyboard without fear of doing something wrong because Learn Keys processes the keys before they are presented to the system. In the second, the user can use Talking Learn Keys to announce keys for any program on the computer. This can be useful for providing high quality feedback for number entry in data processing applications or simply to verify the user is typing properly in any application. The program will use prerecorded speech from professional narrators and allow the user to choose either a male or female voice. There are also options for fast or normal speed announcement of key presses.

Work during FY 1998. The idea for Talking Learn Keys was discussed and presented to the Product Review Committee who approved development of such a program. The technology group in the Educational Research Department developed initial design specifications and a working functionality features list. Programming began on a basic dynamic link library (DLL) keyboard hook. The team prepared test keyboard recording samples and messages and a list for final recording. Initial Microsoft Foundation Class (MFC) and "C"-based programs were developed to use DLL and recorded output along with a key name display for large type.

Work planned for FY 1999. The programming, including menu options and inclusion of the APH Speech Environment (ASE), will be completed and tested. Professional recordings of the digital messages will be created. A setup procedure, electronic documentation, and CD-ROM pre-master will be prepared. Talking Learn Keys will be field tested and revisions will be made as indicated by the field test results. Final specifications will be written and this product will be prepared to enter APH's production process.

Multiple Disabilities

Multihandicapped Adolescent Project (discontinued)

Purpose: To develop a manual of functional and community-based learning activities designed to meet the needs of adolescent multihandicapped, visually impaired students

Project staff: Martha Majors, Project Author/Consultant
Mary Zatta, Project Author/Consultant

Background. The Multihandicapped Adolescent Project is targeted for students who have achieved basic skill levels and are involved in an educational program emphasizing self-care, domestic skills, independence, and life/community living skills. Written activities include functional and age-appropriate applications, stressing skills useful in a community-based setting. Applications of functional academics are also incorporated into project activities. The manual is also applicable to adolescent students with dual sensory impairments.

The Multihandicapped Adolescent Project manual was field evaluated nationally by teachers in 10 programs that work with students with multiple disabilities at the adolescent level. Necessary revisions include improving the clarity and consistency of the text, formatting for easier use and readability, increasing the application of functional academics, incorporating additional community-based experiences, and strengthening the language/communication component.

Work during FY 1998. No work was accomplished on this project during FY 1998. The project has been temporarily discontinued until priorities in this area can be determined.

Work planned for FY 1999. APH is seeking a full-time project leader in the areas of Early Childhood and Multiple Disabilities. Once the Early Childhood/Multiple Disabilities Project Leader joins the Educational Research Staff, new priorities in these areas will be established utilizing imput from appropriate experts and consultants in the field.

Science

Science Curriculum Adaptation: Animals (new)

Purpose: To develop a set of materials for blind and low vision students in grades K-3 that promotes active, hands-on learning activities emphasizing basic science concepts related to animal life

Project Staff: Karen Poppe, Project Director
Tom Poppe, Pattern and Model Maker
Katherine Robinson, Consultant
Jennifer Guelda, Consultant
Emily Bowers, Consultant

Background. Sense of Science: Animals, as it is formally named, is the second module in a series intended to make the "world of science" accessible to young students with visual impairments. This new set of science materials will resemble in both content and design the introductory module, Sense of Science: Plants, incorporating both fun-filled, hands-on activities, and tactile and visual overlays for use with APH light boxes. (See the write-up on Science Curriculum Adaptation: Plants for additional information.)

Work during FY 1998. While the project leader focused attention on preparing Sense of Science: Plants for production, the project consultants began composing simple hands-on activities that could be used to introduce and reinforce concepts related to animal life. Some of these activities include:

"To Fly or Not to Fly" (exploring the structure and function of bird feathers)
"Reptile, Mammal, or Amphibian" (classifying animals by different attributes)
"Cover This!" (investigating various types of animal coverings such as fur, shells and feathers)
"How They Can Change" (studying metamorphosis)
"Hibernation Time" (understanding the purpose of hibernation by some animals).

Project consultants also compiled lists of recommended resources and juvenile books to be included in the guidebook.

Work planned for FY 1999. During the first half of the fiscal year, roughly 30 activities related to animal life will be designed. These activities will be modeled after the plant activities written for the first module. The main components of each activity will include the following: the stated objective of the activity, the vocabulary encountered, the needed materials, a step-by-step procedure, an extension activity for older students, a math connection, a language connection, suggestions for visual adaptations, and a science tidbit. Once the content of the activities is determined, the project leader, with the assistance of the model maker, will develop supplemental tactile and visual overlays to aid in reinforcing concepts encountered in the activities. The overlays will be designed for use with existing APH light boxes or as stand-alone materials. Accompanying trays will enable alignment of overlays placed on top of each other. The guidebook, trays, and overlays will be housed in a plastic, portable container. The design of the materials will connote an obvious continuation of the science series, Sense of Science.

Approximately nine prototype sets of the materials will be developed and sent to expert reviewers in the field to use with students who are blind or have low vision. Field testing is scheduled for the fourth quarter of this fiscal year.

Science Curriculum Adaptation: Plants (continuing)

Purpose: To develop a set of materials for blind and low visions students in grades K-3 that promotes active, hands-on, learning activities emphasizing basic science concepts related to plant growth

Project Staff: Karen Poppe, Project Director
Tom Poppe, Pattern and Model Maker
Katherine Robinson, Consultant
Jennifer Guelda, Consultant
Emily Bowers, Consultant

Background. With considerable frequency, students with visual impairments are exempted from science experiences that involve hands-on participation. Basic science concepts are critical for young children as a basis for building more advanced concepts. The original project leader's plan was to develop a comprehensive manual consisting of nine units under three main headings: "Life Science," "Earth Science," and "Physical Science". The units would address concepts related to plants; animals; habitats and ecosystems; astronomy; weather; energy; electricity and magnetism; solids, liquids and gases; and simple machinery. Concerned about getting these materials created and produced in a timely fashion, the new interim Director of Educational Research advised the project leader at that time to approach the project in a more modular fashion—to complete a manual on "plants" only and then proceed to introduce future manuals addressing the remaining topics. Expecting the planned supplemental materials to vary from unit to unit in both design and number, the project leader agreed that this modular approach would allow more expeditious production of the manual and related tangibles.

Work during FY 1998. The current project leader worked with consultants to prepare the content of the guidebook for field testing. The project leader and the model maker also refined the design of the plant overlay cards and the accompanying trays that stabilize the materials when used alone or with the APH light boxes. A cardboard container was designed to house the entire contents of the science materials—the trays, guidebook, and plant overlays—for storage and transport. Seven prototypes of the entire set of materials were then developed, as well as an extensive evaluation form to allow field test evaluators to thoroughly critique the materials. Participating field test sites consisted of six teachers of visually impaired students in the states of Idaho, Massachusetts, New Mexico, Georgia, Nebraska and New Hampshire. Five of these field test sites were inclusive settings and the remaining site was a residential school. The field test stage extended from March through May.

Evaluative comments from field test reviewers confirmed the need and usefulness of these new materials for introducing and reinforcing science concepts related to plant growth to young, visually impaired students. The pairing of the tactile element with the visual overlay proved especially beneficial for low vision students. A formal report of the field test results was prepared. Having analyzed field test results, the project leader reconvened

the Product Development Committee to discuss needed product changes, to outline expected tasks, and to detail team members' responsibilities for the remainder of the timeline.

During the fourth quarter of the year, the project leader focused on preparing Sense of Science: Plants (final product name approved by APH's Product Name Committee) for production and determining final product specifications.

Work planned for FY 1999. The pilot run for the Sense of Science: Plants is scheduled for the second quarter of FY 1999. Efforts will be focused on completing production specifications and all necessary tooling. With the assistance of the project leader, brochures and marketing materials will be prepared. The Sense of Science: Plants will be produced and showcased at the summer 1999 conferences.

Tactile Graphics

Basic Science Tactile Graphics (continuing)

Purpose: To produce a set of thermoformed tactile graphics depicting science concepts commonly covered in grades 4–6, along with a teacher's guidebook giving suggested uses of the graphics

Project Staff: Fred Otto, Project Director

Background. Because of special monies allotted for the purpose, and with the recommendation of the Research and Development Committee, it was decided to produce materials in the area of science. A demand for science education has been expressed in the national education goals and by the major consumer groups in the field of blindness and visual impairment. This project and others underway related to science also help address a relative lack of APH materials in this content area.

Text books for grades 4–6 contain many illustrations that can be turned into meaningful tactile graphics. Since much of the material covered in grade 4 is revisited in grades 5 and 6, it was reasonable that a set of well designed graphics would be useful at any of these grade levels.

Work during FY 1998. Project staff continued designing graphics for the set using the Drafix CAD program. Because of work on the tactile graphics videos taking precedence, the timeline for this project was revised significantly.

Work planned for FY 1999. Samples will be made from the drawings and sent out for field testing in FY 1999. Revisions will be made as indicated by the field test results, a final set of graphics, cover artwork, a guidebook, and specifications will be ready for the preproduction phase in order to complete the project.

Tactile Graphics Research (ongoing)

Purpose: To study and develop techniques for making useful tactile graphics, to work toward standards in tactile graphic presentations, and to evaluate product submissions and ideas from the field related to tactile graphics

Project Staff: Fred Otto, Project Director
Tom Poppe, Project Assistant

Background. APH has a variety of means for producing tactile graphics, including embossed paper, puff ink, capsule paper, and vacuumform. One goal of research is to learn which media are suited to which kinds of uses and what the costs are of each.

In addition, tactile graphics products are frequently submitted by teachers or other professionals who would like to collaborate with APH in producing their materials. Some of these are well researched and well crafted and merit serious consideration. Another aspect of research is to monitor developments in practice, technology, and philosophy as they evolve.

Work during FY 1998. The project leader met with an ongoing in-house committee to discuss APH's potential involvement in grants that would use technology to disseminate tactile graphics; reviewed tactile samples of screen shots that accompany the Windows 95 tutorial and discussed improvements with the designer of the artwork; met with APH's Braille Editor to discuss the Braille Department's adaptation of books on geography and animal anatomy; conversed with Hoelle Corvest from La Cite des Sciences in Paris regarding two sets of tactile teaching materials she sent for our consideration and asked her to submit research findings to support the merits of the materials; used the Internet to investigate rapid prototyping methods for making tactile models; discussed APH's involvement in producing Art Education for the Blind materials, especially regarding the tactile graphics in the product; and attended sessions at the National Braille Association regional conference to gather ideas about issues and needs important to transcribers.

Work planned for FY 1999. These efforts will continue, especially as they relate to helping those who make and teach tactile graphics.

Tactile Graphics Videos (continuing)

Purpose: To produce instructional videos demonstrating best practices, tools, and design considerations for making tactile graphics

Project Staff: Fred Otto, Project Director
Wanda Pierce, Project Author/Consultant

Background. Because of the leading role APH has played in production of tactile graphics and the frequent request APH staff receive for workshops on tactile graphic design and creation, it was decided that a video made partially with special funds allotted to the Educational and Advisory Services Department would be a valuable and effective tool for the field.

Work during FY 1998. The project director negotiated a contract with Wanda Pierce, a tactile graphic designer from Montreal, to write scripts for the videos; interviewed production houses about scripts and preproduction issues and contracted with one that offers digital editing; maintained close contact and gave direction as the project author drafted scripts; had scripts reviewed in a variety of locations and oversaw script revisions based on evaluations; met with production company for casting and rehearsals; created sample graphics for use in the videos; monitored shooting of the videos; codirected the editing for master tapes; assembled print, braille, and graphic items to be included in accompanying materials; and worked on packaging design for the final product. Quota approval was granted for this product at the Interim Meeting of the Research Development Committee held in May.

Work planned for FY 1999. The videos will be completed, and a booklet to accompany the videos will be written. The videos will be debuted at APH's 1998 Annual Meeting of Ex Officio Trustees. Production specifications will be completed, and the kit of items will be produced and made available.

The digital medium of the videos will allow for different uses and presentations of their content, such as putting the material on interactive CD or on the APH website, but no actions are planned for now.

Tests and Measurements

Directions for Administering the Large Type Version of the Stanford Achievement Series, Ninth Edition, Form S, Complete Battery/Multiple Choice (completed)

Purpose: To write supplemental directions to accompany the original print instructions for administering the large print version of the Stanford 9

Project Staff: Gail Glanz, Project Director
Brett Page, Project Author/Consultant

Background. In 1996, members of the Educational Research and Development Committee recommended that APH adapt the Stanford 9 Complete Battery for students requiring large print and braille. Ten levels of the Stanford 9 were edited for braille and all print supplemental manuals for administering the braille edition were produced, packaged, priced, and in stock before mid-March 1997. Ten levels of the Stanford 9 were scanned and edited for large print, produced, packaged, and priced before mid-April 1997.

Work during FY 1998. Supplemental instructions for administering the large print edition were written, reviewed, and revised. Camera-ready and disk copies were provided for duplication. The final product was completed and made available at the end of April 1998.

Work planned for FY 1999. No additional work on the Stanford 9, Form S, Complete Battery/Multiple Choice test is planned. APH staff will consider adapting the Stanford 9 Abbreviated Test Battery if needed.

Test and Assessment Focus Group (completed)

Purpose: To determine the needs of the field with regard to testing and assessing blind and visually impaired students and adults

Project Staff: Gail Glanz, Project Director

Background. A Tests and Assessments Project Leader was added to APH's staff in March of 1998. A Tests and Assessments Needs Meeting was planned in order to determine and prioritize the needs of the field in this area.

Work during FY 1998. A meeting of APH staff, psychologists, test administrators, educators and other pertinent vision personnel was held at APH in July 1998 to determine and prioritize test concerns and assessment tools needed in the area of testing blind and visually impaired students and adults. Consultants included Dr. Carol Allman, Joe D'Ottavio, Dr. Genie Hartmann, Dr. Sandy Lewis, Marnee Loftin, and Dr. Mila Truan. APH staff who participated were Dr. Tuck Tinsley, Debbie Willis, Mary Nelle McLennan, and Barbara Henderson. The focus group devised thirty-five pertinent weaknesses in the area of tests and assessments. Suggested goals were categorized into two primary headings:

Need for Guidelines for Formal Testing of Visually Impaired Students, and
Need for Training and Inservice on Best Practices in Assessment.

The project leader took the suggestions of the focus group, drafted a survey form, and administered the form to school personnel attending a symposium for assessment and counseling professionals sponsored by the California School for the Blind.

Work planned for FY 1999. The Educational Research staff will determine how best to address the two primary needs identified by members of the Test and Assessment Focus Group and will begin projects to address these needs. APH will receive special funding during FY 1999 to develop a computer administered test accessible to blind and visually impaired students and clients. This project will be planned and undertaken.

National Literary Braille Competency Test (new)

Purpose: To collaborate with the National Library Service for the Blind and Physically Handicapped (NLS) to help formulate and produce a revised competency test that ensures braille teachers meet standard qualifications for knowledge of the literary braille code

Project Staff: Eleanor Pester, Project Codirector
Debbie Willis, Project Codirector
Mary Lou Stark, NLS Project Director
Judy Dixon, NLS Project Assistant
Deirdre Knapp, HumRRO Project Consultant

Background. In recent years, concern has been expressed about the amount and quality of braille instruction provided to blind children and adults. In response to this concern, the Committee on Joint Organizational Effort requested NLS to develop a literary braille competency test. Work on this test began in 1989. Administration of the test began in 1994. In 1996, the Human Resources Research Organization (HumRRO) began a validation study of the test, conducting a thorough job analysis and furnishing recommendations for revising the test's content so that it closely matches the current knowledge and skills required of braille teachers.

In April of 1998, NLS approached APH with the proposed joint effort in revising this test. A meeting was conducted at APH in May 1998 with personnel from HumRRO, NLS, and APH. The validation process and recommendations were reviewed. A tentative proposal was drafted and reviewed by the Director of Educational Research at APH and by NLS staff.

In July 1998 an agreement between APH and NLS was concluded. APH's primary goals will be the formulation of and participation in necessary committees, maintaining a test item bank database, and producing test-related materials. NLS will solely be responsible for administering the pilot study, identifying proctors, handling the application process, and supervising test administration sites.

Work during FY 1998. APH and NLS jointly will be involved in the revision phase of the project. Joint staff will identify members of two standing committees: Administrative Issues Committee and the Test Development Committee. A meeting will be planned in Fall 1998 to initiate coordination of these efforts.

Work planned for FY 1999. Administrative decision making about test item development and process will be continued. Pilot tests will be scored, and the item bank database will be implemented and maintained by the APH project team. Physical production of test related materials will be initiated.

Transition

Early Childhood Transition Project (continuing)

Purpose: To develop a set of materials useful to families and professionals for transitioning young children with visual impairments and/or multiple disabilities from infant/toddler to preschool programs, as well as from preschool programs to school programs

Project Staff: Debbie Willis, Project Codirector
Sheri Moore, Project Codirector
Diane Haynes, Project Author/Consultant
Jennifer Grisham-Brown, Project Author/Consultant

Background. The project authors submitted a document to APH's Product Review Committee entitled Reach for the Stars: Planning for the Future. The project authors had conducted training using these materials in several states and had found them well received and helpful to both professionals and families. Reach for the Stars: Planning for the Future materials had been used primarily with visually impaired students with multiple disabilities, including dual sensory impairments. The materials imbed a person-centered approach in their orientation and value the continuing involvement of families in "directing" their child's educational program and in planning an optimal future for their child.

In 1997, following the submission of Reach for the Stars: Planning for the Future materials by the project authors, APH staff conducted an in-house review. The materials then went through an internal product review process, and it was agreed that the materials had universal appeal. The initial project director met with the project authors, analyzing and discussing how the materials could be enhanced prior to the formal field evaluation. A series of modifications, revisions, and additions to the materials were discussed, and a plan was developed for putting these changes in place.

Work during FY 1998. The new project director met with the authors in order to develop a contractual agreement, to review and finalize the evaluation form, to determine remaining steps necessary to complete the project, and to discuss the project authors' interest in collaborating on a video. The project director worked with the authors to get releases from individuals pictured in the Reach for the Stars document, worked with one of the project authors on potential field evaluators of the document, and reduced the field evaluation period from four to one month.

Reach for the Stars: Planning for the Future was sent to consultants in the field for expert review. The data was collected and analyzed.

Work planned for FY 1999. The necessary revisions will be implemented and the document will be completed. Production specifications will be determined and finalized, and Reach for the Stars will be produced.

Transition Tote System (completed)

Purpose: To develop materials that promote organizational skills, social and self-advocacy skills, and personal responsibility in order to assist high school age students who are blind or have low vision as they explore and prepare for the work world

Project Staff: Frank Hayden, Production Assistant/Technical Research

Background. The Transition Tote System was designed to meet the needs of students who are blind or visually impaired as they prepare for the world of work. The Student Kit includes an organizer case (the Tote Case) that contains the APH print/braille calendar and clipboard. The Tote Case is available separately as a replacement item. The Student Manual is the other component of the Student Kit. It offers 30 lessons. The student materials are available in large print, braille, and on cassette. The Information Supplement, available as a separate product, is offered in print and in braille. The supplement was designed for use by teachers and other facilitators of the student's program.

The print version of the Student Kit and Information Supplement became available during the last quarter of FY 1997.

Work during FY 1998. The Transition Tote: Student Kit (braille and cassette versions) and the Transition Tote: Information Supplement (braille version) were completed and made available. All versions of the Transition Tote System were reviewed by Eleanor Pester in the Educational Research Department and Karen Wolffe, project coauthor and consultant.

Work planned for FY 1999. The project is completed. Some slight modifications to various components of the Transition Tote System are anticipated as a result of evaluative information received from use of the product in the field and reviews by Educational Research staff and project consultants.

Transition Video (completed)

Purpose: To create a video that complements APH's Transition Tote System and details several key areas that children and youth with visual disabilities must address in order to be successful in the transition from school to work and adult responsibilities

Project staff: Frank Hayden, Production Assistant/Technical Research
Debbie Johnson, Project Coauthor and Codirector
Jan Carroll, Project Assistant/Advisory Services

Background. Navigating the Rapids of Life, the final product name of a VHS videotape and booklet identifies the common base of skills and experiences necessary for life success. The video focuses on employment success for young people with visual disabilities. This project was funded previously through a grant received by APH's Educational and Advisory Services Department.

The premise of the video is that transition to the workplace begins in early childhood with foundation skills that are developed at home, in school, and in the community. As children mature, they build upon early learning experiences and can apply their skills in volunteer and paid work situations. Refining and adapting these skills is a lifelong process.

The video details several key areas that children and youth with visual disabilities must address in order to be successful in the transition from school to work and adult responsibilities. These are:

- incidental learning which occurs when a learner observes people, animals, and things in the environment to discover information about the world;
- organizational skills are important for all people but are an absolute necessity for people who are blind, who can't simply glance around to find items;
- compensatory skills which include reading and writing with braille or low vision devices, traveling with a long cane or dog guide using adaptive technology, etc.;
- social skills, including social behaviors that are not verbal and not observable, which are often learned incidentally but may need to be taught to a person who is visually impaired;
- opportunities to work at home, in school, and as a member of the community which contribute to self-esteem, a sense of belonging, and enhancement of skills.

The video is closed captioned and video described. Highlights from the video are presented in an included print booklet which is available in accessible media upon request. The booklet also includes a resource list and a list of organizations.

Work during FY 1998. Technical Research completed production documentation and specifications on the product. The video was produced, close captioned and audio described at a company outside of APH. After having samples checked by APH personnel and making the necessary corrections, the videotapes were reproduced and put into stock in June 1998.

Work planned for FY 1999. This project has been completed. No additional work on this particular video is anticipated.

Other Activities

Kids Committee (new)

Purpose: To provide a forum in which blind and visually impaired students can express their views about new product ideas, product names, and product designs, features, components, and uses

Project staff: Karen Poppe, Project Codirector
Fred Otto, Project Codirector

Background. The American Printing House for the Blind hosted its first Kids Committee on Saturday, April 4, 1998. The participants included five visually impaired students who ranged in age from 7 to 14 years old; three of the members were totally blind and the remaining two had some functional vision. All of the students were from fully-inclusive educational settings.

Specific topics covered were students' likes and dislikes of the braille and large print books they use, and the students' preferences of games and recreational activities. Committee members also had the opportunity to actually manipulate products currently under development at APH and to suggest alternate uses and names for these products.

At the close of the meeting, both students and parents expressed an appreciation for the opportunity to share their experiences and ideas in the company of others from similar backgrounds. Parents and students perceived their involvement as a special honor and as a way to positively affect educational materials used by students with visual impairments. Enthusiasm was unanimously expressed by the students for another "Kids Round Table" meeting.

Work during FY 1998. The 1997 Research and Development Committee, as well as other parties, expressed a desire for APH to keep "kid friendly" design in mind as products are created. To further that end, the Director of Educational Research made a commitment to have the department's staff members decided to gather a focus group of students to listen to the students express their wishes and concerns regarding educational materials.

Work planned for FY 1999. The "Kids Round Table" will be called together 3-4 times yearly, or as needed by project directors, to discuss products needed by students, groups of products under development, general design considerations, or possible revisions to currently available products.

Product Accessibility Committee (new)

Purpose: To review products under development and provide recommendations regarding the media in which the products' components should be made available

Project staff: Debbie Willis, Committee Chairperson

Background. At the 1997 Interim Meeting of the Research and Development Committee, committee members focused a great deal of attention on the need for APH materials to be available in media accessible to blind and visually impaired persons.

Work during FY 1998. Preliminary meetings of various APH personnel were held and the following guidelines were established:

- APH is committed to making materials accessible.
- Materials will be offered in accessible media. Primary considerations for media chosen will be based on intended audience(s).

An official Product Accessibility Committee was formed which included:

Jack Decker—Production
Will Evans—Educational and Advisory Services
Anna Fox—Cost Department
Fred Gissoni—Customer Relations
Elaine Kitchel—Educational Research, Low Vision Specialist
Mary Nelle McLennan—Executive Committee
Gary Mudd—Public Affairs
Eleanor Pester—Educational Research, Braille Specialist
Bob Phelps—Technical Research
Larry Skutchan—Educational Research, Technology Specialist
Debbie Willis—Educational Research

After the committee was established, two meetings were held with project leaders to review products under development and make recommendations regarding the media in which the various components should be made available. During one of the meetings, a step was taken to make APH a model for accessibility. The group established APH's internal Electronic Forms Committee with Larry Skutchan directing this subcommittee.

Work planned for FY 1999. Bob Brasher, the new Director of Educational and Advisory Services will be added to the committee. A new chairperson will be selected for FY 1999. The Preschool Activities Calendar that the committee determined needed to have the activities available in braille and large print and the Developmental Guidelines for Infants with Visual Impairment manual that the committee recommended be available in recorded format are on the schedule and will be produced this fiscal year.

The Accessibility Committee will continue to review products and make recommendations throughout FY 1999. It is a goal of the committee to review products early enough in the development process that the recommended media are produced and available at approximately the same time. The Electronic Forms Committee will meet to determine how to make the various internal forms used by APH personnel accessible electronically.

Technical Research Report

Technical Research Division

Purpose: To prepare and introduce new products to APH's production process and to adapt or develop products involving technology

Division Staff: Bob Phelps, Manager
Frank Hayden, Manufacturing Specialist
James Robinson, Manufacturing Specialist
Darlene Donhoff, Technical/Clerical Assistant

Work during FY 1998.

Adapted Protractor. (completed) The final product name of the adapted protractor is Print/Braille Protractor. Technical Research staff completed product documentation and specifications on the protractor in April. Project personnel originally designed a drawing for a die to cut out the "pointer" for the protractor. When testing the die, however, it was found that pieces had rough edges, were bent, and would not lie flat. Technical Research personnel next designed a process for using the router to cut out the pointers. This process worked perfectly to cut out pointers with smooth edges and have them lay flat. The first production run was completed and the print/braille protractors were placed in stock in June 1998.

Analog Clock Model. (completed) Production documents and specifications were completed last fiscal year by Technical Research staff and orders were placed to have the parts made. Sample parts were received and approved. The first production run of parts was manufactured and received in-house. Technical Research staff monitored the initial production run of the redesigned Analog Clock Model through completion and into stock in March 1998.

Basic Science Tactile Graphics. (new product) Technical Research staff continued working with Graphics Department personnel, helping them with the drawings using the Drafix program.

Basic Tactile Anatomy Atlas. (completed) Technical Research staff completed product documents and specifications as well as all the tooling required. The first production run of the thermoformed drawings was monitored and some problems were noted. A production review meeting was held to determine the changes needed so that problems encountered in the initial production run would not be repeated. Technical Research staff monitored the second production run to ensure all suggested changes were followed. The second production run was completed correctly and placed into stock.

Beginner's Abacus. (completed) Production documents and specifications were completed by Technical Research staff. Work orders were opened for the manufacturing of the parts which were received in early March 1998. The first production run was monitored by Technical Research staff through its completion and placement of the product into stock.

Braille 'n Speak Scholar. (new product) Research staff worked with Blazie Engineering, Inc., on designing a custom version of the Braille 'n Speak 2000 with features as outlined by a committee of APH personnel. A contractual agreement was completed and APH's Purchasing Department issued a purchase order to have Blazie Engineering tool the Braille 'n Speak Scholar for APH. Fred Gissoni in Customer Service is writing a manual to accompany the Scholar.

Brain Quest: Science. (new product) Technical Research completed the production documentation and specifications for this product which involves production of two separate kits. The large print kit was completed and placed in stock in April 1998, five months ahead of schedule. Technical Research staff monitored the progress of the print/braille combination kit through the production process. The print/braille version of Brain Quest: Science was completed and placed in stock in July 1998.

Card Chart Kit. (new product) Technical Research staff completed documentation and cutting die drawings. An order for the dies was placed and they were received. Technical Research monitored the completion of the pilot run in March 1998, then completed the documentation and specifications for the Blank Cards Kit, which will be available as an individual kit and also as part of the Card Chart Kit. Product documentation was started on the five remaining kits to this series: "Number and Math Signs," "Addition Facts," "Subtraction Facts," "Multiplication Facts," and "Division Facts."

ColorTest. (completed) Technical Research completed all documentation and specifications on the ColorTest device. Purchase orders were placed for 25 ColorTest units which were received in-house in February 1998. All units sold and additional purchase orders were placed for more ColorTest units.

Developmental Guidelines. (new product) Technical Research completed documentation and specifications for Developmental Guidelines. The first production run of the product was monitored. The print manual was completed and placed in stock in August 1998.

Digital Clock Model. (on hold) Production documentation and specifications were completed by Technical Research staff. A request to redesign one of the parts was made in order to assemble the product in-house. Parts were ordered, but never received. Bid packages were sent to several other vendors for price quotes. The quotes received were considerably higher than those of the original vendor. A decision was made to revisit the product to determine if it should still be pursued. Technical Research is also re-examining the design of parts to see if modifications can be made in order to reduce production cost.

Hundred Boards and Manipulatives. (new product) Technical Research staff completed documentation and cutting die drawings for the Hundred Boards and provided the necessary information to the appropriate production areas. The pilot run in June and the first production run in July 1998 were monitored by Technical Research personnel.

Individualized Systematic Assessment of Visual Efficiency (ISAVE). (new product) Technical Research staff completed product specifications and tooling, and located samples of materials that were to be included in the kit.

Listening to Windows 95. (new product) Technical Research staff assisted the project leader in finding samples of various items needed to make prototype kits for field testing. The product specifications and tooling for this product are nearly completed.

Money Handling and Budgeting: A Resource Guide for Use with Adolescents or Young Adults Who Are Blind or Visually Impaired. (completed) Technical Research staff completed product specifications for the braille edition of this product and provided them to production staff. The first production run was completed and placed in stock in November 1997.

Numbers Set for Hundred Boards. (new product) Technical Research staff completed documentation and cutting die drawings for the Numbers Set that are part of the Hundred Boards kit. All necessary information and materials were provided to the appropriate production areas. The pilot run in April and the first production run in July 1998 were monitored by Technical Research staff.

On the Way to Literacy III: The Alphabet Book. (on hold) Technical Research staff completed the product documentation and specifications on the original design of the fifth book in the series. Technical Research staff are continuing to work with the project leader to find new methods of adding "sounds" to this book in order to make it more interesting to young readers.

On the Way to Literacy III: Giggly-Wiggly Snickety-Snick. (new product) Technical Research staff completed the tooling and product documentation for the third book in the series. The artwork and specification for the binders were completed; binders were ordered and received. The print pages were produced out-of-house and were received.

On the Way to Literacy III: The Gumdrop Tree. (new product) Technical Research staff completed tooling and product specifications for the fourth book in the series and provided the necessary information and materials to the production staff. The artwork and specifications for the binder were completed; a purchase order for the binders was placed; and drawings required for having die-cutting molds made were completed. The molds were ordered and received. Technical Research staff sent camera ready copy of the print pages to a vendor in order to have the print pages produced for this book. Technical Research staff received "blue lines" of the pages, approved them, and gave permission to produce the pages which were received in August 1998.

On the Way to Literacy III: Jelly Bean Jungle. (new product) Technical Research staff completed the tooling and product specifications for the first book and provided the necessary information and materials to the appropriate production areas. The artwork and specifications for the binder were completed, the binders were ordered and received, and the scent stickers required for this book were ordered. The print pages were produced out of house and received. The plastic material for making the clear overlays did not arrive as scheduled which caused a delay in completing this book.

On the Way to Literacy III: Thingamajig. (new product) Technical Research staff completed tooling and product specifications for the second book in the series and provided the necessary information and materials to the production staff. The artwork and specifications for the binder were completed, the binders were ordered and received, drawings required for two die-cutting molds were designed, ordered and received. The print pages were produced out-of-house.

Patterns Pre-Primer. (completed) Technical Research staff completed product documentation and specifications for this product and provided it to production personnel. The first production run was monitored through completion and placement of the items in stock in June 1998.

Patterns: Primary Braille Spelling and English Program—Level D. (new product) Technical Research staff started work on the product documentation for this program.

Preschool Activities Calendar. (completed) Technical Research staff completed product documentation and specifications and provided them to the appropriate production areas. The product was monitored through completion of the first production run in April 1998.

Primary Math Units. (new product) Technical Research staff started preliminary work on the product documentation and specifications. The project leader drafted work sheets that will be part of this kit as well as available separately.

Portable Sound Source II. (redesign) Technical Research staff worked on redesigning the Portable Sound Source circuit board and mocked up a prototype circuit board for testing. Bid packages for building the new boards were sent to vendors for price quotes. A vendor was selected to manufacture the boards and an order was placed. Technical Research staff completed the product documentation needed on the revisions of this product and provided it to production personnel. The circuit boards and cases were received. Technical Research staff will monitor the first production run of this product.

Program to Develop Efficiency in Visual Functioning: Addendum. (completed) Technical Research staff worked with the project director on final changes to the revised Source Book and the Volume III addendum. The product documentation and specifications for the Addendum kit were finalized and steps were taken to ensure that the new Addendum component would be packaged with current and future sets of the Program to Develop Efficiency in Visual Functioning. Technical Research staff worked with the Purchasing and Operations Engineering departments to get price quotes on the new parts, and bills of materials and routings for the Addendum kit. The first production run was completed and went into stock in June 1998.

Quick Pick. (new product) This set of products was originally called Poke and Pull. Technical Research staff worked on product documentation and specifications for the first four kits to this series which are "Addition," "Subtraction," "Multiplication," and "Division." Drawings were designed and sent to vendors to get bid quotes for making a case that will house each set of cards.

Score Card. (completed) Technical Research staff completed product documentation and specifications for the Score Card. A drawing for the die was designed; the die was ordered and received. Technical Research staff monitored the first production run of the Score Card through its completion and placement in stock in January 1998.

Sense of Science: Plants. (new product) The working name of this project was "Science Curriculum Adaptations: Plants." Work on the product documentation and specifications for this new product was started. Technical Research staff worked with the project leader to find new materials to be used in this kit.

Sleep Switch. (new product) Technical Research staff developed a prototype of the Sleep Switch and submitted it to APH's Product Review Committee and Executive Committee for approval, which was received. Bid packages were then sent out for price quotes. Product specifications are underway.

Speech Expressor. (new product) Technical Research staff designed this product. Production documentation and specifications were completed. A purchase order was opened to have the plastic case and parts made and another to have the circuit boards made. Technical Research staff will monitor the pilot and production runs of the Speech Expressor.

Table Top Recorder/Player. (new product) Technical Research staff originally started work with a vendor on redesigning APH's Table Top Recorder/Player. As problems arose, it became necessary to send three additional bid packages to find another vendor willing to take on this project. A new vendor was selected and a prototype sample was received from the second vendor in January 1998. Technical Research staff detailed additional changes needed and provided these to the vendor. In July, production samples were received for evaluation. These were reviewed and returned with problems noted that were to be corrected before beginning the first production run. The preproduction run is in process as of this time.

Transition Tote System. (completed) Technical Research staff completed production specifications for the Transition Tote: Student Kit (Braille and Cassette Tape Versions) and the Transition Tote: Information Supplement (Braille Version) and provided them to the appropriate production areas in March 1998. The first production run of each of these was completed and placed into stock.

Transition Video. (completed) Technical Research staff completed product documentation and specifications on this product. The progress on the close captioning and audio description of the video were monitored. The video was created and duplicated by an outside vendor. Copies were completed, checked, and put into stock in June 1998.

Windows Training Board. (new product) Product documentation and specifications on this product are in the early stages of development.

Work planned for FY 1999.

In addition to completing the new products listed above, Technical Research staff will be available to assist in other areas as needed. Members of the Technical Research Staff will also be involved with the following new projects:

Boldline Spiral Notebook. (new product) A suggestion was made by an ex offico trustee to put the currently available bold line paper inside a notebook binding. Technical Research staff will begin product documentation and specifications on this product. The initial production run will be monitored.

Bright, Beautiful and Bold Book of Fruits. (new product) Technical Research staff will begin production documentation and specifications on this product. The first production run will be monitored.

Large Puzzle Map of the U.S.. (redesign) This project involves redesigning the U.S. Puzzle Desk Map last made by APH in 1988. Technical Research staff will begin production documentation and specifications on this product. The first production run will be monitored.

Master Plan Calendar. (new product) Technical Research staff worked with the project leader to make prototypes and started preliminary work on the production documentation and specifications. The initial production run of this product will be monitored.

Reach for the Stars—Early Childhood Transition. (new product) Technical Research will begin production documentation and specifications on this product. The first production run will be monitored.

Reading Stand. (new product) Technical Research staff will begin production documentation and specifications on this product. The first production run will be monitored.

Router Projects. (ongoing) Technical Research staff will continue to review existing products for the purpose of revising procedures in order to manufacture the parts in a more efficient, safe, and cost effective manner.

Sense of Science: Animals. (new product) Technical Research staff will begin production documentation and specifications on this product. The first production run will be monitored.

Tactile Graphics Videos. (new product) Technical Research staff will begin production documentation and specifications on this product. The first production run will be monitored.

Talking Learn Keys. (new product) Technical Research staff will begin production documentation and specifications on this product. The initial production run will be monitored.

APH's Department of Educational and Technical Research Staff

Educational Research

Bagley, Martha, M.S.	Research Scientist
Bolin, Gene	Administrative Assistant
Curry, Loretta	Secretary
Glanz, Gail, M.A.	Research Scientist
Jackson, Jimmie, M.A.T.	Research Assistant
Hedges, John, B.S.	Programmer II
Kitchel, Elaine, M.Ed.	Research Associate
Meredith, Rob	Programmer I
Moore, Sheri, Ed. D.	Research Scientist (part-time)
Otto, Fred, B.A.	Research Associate (part-time)
Pester, Eleanor, M.S.	Research Scientist
Poppe, Karen, B.A.	Research Associate
Poppe, Tom	Model and Pattern Maker
Roderick, Carol, B.A.	Research Assistant (part-time)
Skutchan, Larry, B.A.	Research Scientist
Willis, Deborah, M.A.	Director

Technical Research Division

Donhoff, Darlene	Technical/Clerical Assistant
Hayden, Frank	Manufacturing Specialist
Phelps, Bob	Manager
Robinson, Jim	Manufacturing Specialist

Contracted Personnel

Bellafonte, Lucia	Lueck, Amanda Hall
Bowers, Emily	Modaressi, Betty
Disney, Chantal	Morris, June
Gevers, Marcia	Page, Brett
Grisham-Brown, Jennifer	Pierce, Wanda
Guelda, Jennifer	Pitzer, Christine
Kaufman, Nita	Robinson, Katherine
Haynes, Diane	Schleppenbach, David
Langley, M. Beth	Wright, Suzette
Leibfritz, William	

Agencies Participating in Research

In addition to the agencies named here, appreciation is also extended to the many other agencies that cooperated with APH's research efforts by permitting members of their staffs to serve as consultants or respondents to requests for information.

American Foundation for the Blind; Atlanta, Georgia
Arkansas School for the Blind; Little Rock, Arkansas
Art Education for the Blind; New York, New York
Auburn University; Auburn, Alabama
Ball State University; Muncie, Indiana
Blazie Engineering, Inc.; Forest Hill, Maryland
Blue Bonnet Coop; Weatherford, Texas
Brooks Elementary; Shepherdsville, Kentucky
California School for the Blind; Fremont, California
Carr School; Lincoln Park, Missouri
Catholic Charities; Bangor, Maine
Chandler Tripp School; San Jose, California
Chicago Lighthouse for People Who Are Blind or Visually Impaired; Chicago, Illinois
Children's Center for the Visually Impaired; Kansas City, Missouri
Children's Hospital Eye Clinic; Columbus, Ohio
Columbia Region 6; Portland, Oregon
Dallas Services for Visually Impaired Children; Dallas, Texas
Dorchester Public School; Dorchester, Nebraska
ENTECH; Louisville, Kentucky
Fairfax County Public Schools; Fairfax, Virginia
Family Focused Early Intervention System; Harrisburg, Pennsylvania
Ferris Carr School; Lincoln Park, Michigan
Foundation for Blind Children, The; Cooperative Preschool for Visually Impaired Children; Scottsdale, Arizona
Foundation for the Junior Blind; Los Angeles, California
Ft. Smith Public School; Hodgen, Oklahoma
Georgia Academy for the Blind; Macon, Georgia
Governor Morehead School, The; Raleigh, North Carolina
Hilton-Perkins National Projects; Watertown, Massachusetts
Idaho Commission for the Blind; Boise, Idaho
Jefferson County Public Schools; Louisville, Kentucky
Kentucky Assistive Technology Service Network; Frankfort, Kentucky
Kentucky Department for the Blind; Louisville, Kentucky
Kentucky School for the Blind; Louisville, Kentucky
Lavelle School for the Blind; Bronx, New York
Letcher County Public Schools; Whitesburg, Kentucky
Living Skills Center for the Visually Impaired; San Pablo, California
Microsoft Corporation; Redmond, Washington
Microtalk; Texarkana, Texas
Missouri School for the Blind; St. Louis, Missouri

Nebraska School for the Visually Handicapped; Nebraska City, Nebraska
New Hampshire Educational Services for the Sensory Impaired; Concord, New Hampshire
New York State School for the Blind; Batavia, New York
North Dakota School for the Blind; Grand Forks, North Dakota
Northview School; Florissant, Missouri
Overbrook School for the Blind; Philadelphia, Pennsylvania
Perkins School for the Blind; Watertown, Massachusetts
Pinellas County Schools; St. Petersburg, Florida
Prince George's County Public Schools; Landover, Maryland
Recording for the Blind and Dyslexic; Princeton, New Jersey
Region XIX Education Service Center; El Paso, Texas
Ridgeview Elementary; San Antonio, Texas
Santee School District; LaMesa, California
Seeing Eye, Inc., The; Technology Division; Morristown, New Jersey
Southern Illinois University; Carbondale, Illinois
TecSo Inc.; Montreal, Canada
Tennessee School for the Blind; Nashville, Tennessee
Texas School for the Blind and Visually Impaired; Austin, Texas
University of British Columbia, Children's Hospital; Vancouver, British Columbia
University of Kentucky, Special Education Department; Lexington, Kentucky
University of California, Lawrence Hall of Science; Berkley, California
University of Texas at Austin; Austin, Texas
Utah School for the Blind; Ogden, Utah
Variety Club for Blind Babies Foundation; San Francisco, California
Vermont Association for the Blind and Visually Impaired; Burlington, Vermont
Virginia School for the Deaf and the Blind; Staunton, Virginia
Visions; New York, New York
Visually Impaired Preschool Services; Louisville, Kentucky
Washington State School for the Blind; Vancouver, Washington
West Virginia Schools for the Deaf and the Blind; Romney, West Virginia
Western Pennsylvania School for Blind Children; Pittsburgh, Pennsylvania
Wisconsin Department of Public Instruction; Madison, Wisconsin
Wisconsin School for the Visually Handicapped and Educational Services for the Visually Impaired; Janesville, Wisconsin
Wood County Board of Education; Bowling Green, Ohio

Consultants

In addition to the consultants formally acknowledged in this section, appreciation is extended to the many individuals who have willingly given of their time and expertise in cooperating with the various research and development projects underway by responding to questionnaires, by answering less formal queries for information, and by working with research staff in countless ways such as: (a) identifying particularly talented teachers and other professionals to serve on committees and/or as expert reviewers; (b) recommending programs, teachers, and students to participate in field tests; and (c) facilitating field evaluation efforts. Only through the splendid and continuing support of professionals working in the field and the people they serve is APH able to maintain an effective research and development program.

APH especially wishes to acknowledge the superb leadership and guidance from the ex officio trustees serving as members of the Research and Development Committee. FY 1998 committee members were:

Mr. William E. Daugherty, Kansas State School for the Blind
Dr. Philip H. Hatlen, Texas School for the Blind
Dr. Bernadette M. Kappen, Overbrook School for the Blind
Mr. Donald H. Potenski, New Jersey Commission for the Blind
Dr. Dean O. Stenehjem (Chairman), Washington State School for the Blind
Mr. Chris Tompkins, The Foundation for Blind Children

Abacus Basic Competency

Mrs. Rosemary Dawson, Junior High Teacher, Kentucky School for the Blind, Louisville, Kentucky

Sr. Margaret Flemming, Principal, St. Lucy Day School, Upper Darlby, Pennsylvania

Mr. Ted Lennox, Teacher of the Visually Impaired, Ferris Carr School, Lincoln Park, Michigan

Mrs. Susan Millaway, Vision Itinerant Teacher, Montgomery County Intermediate Unit, Norristown, Pennsylvania

Adult Life Needs

Mr. Carroll L. Jackson, Executive Director, Upshaw Institute for the Blind, Detroit, Michigan

Ms. Priscilla Rogers, Consultant, American Foundation for the Blind, Mooresburg, Tennessee

Ms. Susan Ruzenski, Assistant Director, Helen Keller National Center, Sands Point, New York

Dr. Dean Tuttle, Retired, Greeley, Colorado

Dr. Karen Wolffe, Career Counselor, Career Counseling and Consultation, Manchaca, Texas

Elementary Math Aids

Dr. William Leibfritz, Associate Professor, Central Michigan University, Mount Pleasant, Michigan

Individualized Comprehensive Evaluation of Functional Use of Vision in Early Childhood (ICEE)

Ms. M. Beth Langley, Vision Teacher, Pinelas County Schools, Clearwater, Florida

Ms. Rita Monteagudo, Vision Teacher, Pinelas County Schools, Clearwater, Florida

Ms. Suze Staugas, Vision Therapist, Visually Impaired Preschool Services, Louisville, Kentucky

IntelliTactiles

Ms. Collen Heiden, M & H Consulting, Vancouver, Washington

Large Print Project

Dr. Amanda Hall Lueck, Professor of Special Education, San Francisco State University, San Francisco, California

Dr. Joseph Petrosko, Professor of Foundations of Education, University of Louisville, Louisville, Kentucky

Listening to Windows 95

Mr. Tony Candela, The Lighthouse Inc., New York, New York

Ms. Susan Descarage, Perkins School for the Blind, Outreach Services, Northampton, Massachusetts

Ms. Jennifer Erving, Hateville, Georgia

Mr. Warren Figueiredo, Louisiana School for the Visually Impaired, Baton Rouge, Louisiana

Ms. Julie Hart, Prairie Junior High School, Alsip, Illinois

Ms. Eileen Mauerman, Jordan School District, Midvale, Utah

Ms. Susan Meissel, McNair Middle School, Decantur, Georgia

Ms. Jackie McCullers, Creekside High School, Hateville, Georgia

Ms. Tina Perretti, Teacher of the Visually Impaired, New York Institute for Special Education, Bronx, New York

Ms. Mary Phillips, Career Visions, Inc., Louisville, Kentucky

Mr. Bill Schenk, Tennessee School for the Blind, Nashville, Tennessee

Mr. Dan Tonge, Washington Department of Services for the Blind, Seattle, Washington

Low Vision Needs

Dr. Natalie Barraga, Professor of Special Education, University of Texas, Austin, Texas

Dr. Michael Brumit, Low Vision Optometrist, Charlestown, Indiana

Dr. Anne Corn, Professor of Special Education and Ophthalmology, Peabody College, Nashville, Tennessee

Ms. Edith Ethridge, Low Vision Program Coordinator, Kentucky State School for the Blind, Louisville, Kentucky

Ms. Marcia Gevers, Itinerant Rehabilitation Teacher, Indiana Blind and Visually Impaired Services, Fort Wayne, Indiana

Mr. Rod Kossick, Vision Coordinator, Wisconsin Council of the Blind, Milwaukee, Wisconsin

Ms. Christine Pitzer, Rehabilitation Teacher, Indian Blind and Visually Impaired Services, Clarksville, Indiana

Ms. Marilyn Walpole, Vision Teacher, Cincinnati Public Schools, Cincinnati, Ohio

Primary Math Units

Dr. William Leibfritz, Associate Professor, Central Michigan University, Mount Pleasant, Michigan

Program to Develop Efficiency in Visual Functioning: Addendum

Dr. Natalie Barraga, Professor of Special Education, University of Texas, Austin, Texas

Ms. June Morris, Executive Vice President of the American Printing House for the Blind, Retired, Louisville, Kentucky

Ms. Janice Stallings, Teacher of the Visually Impaired, Kansas City, Missouri

Quick Pick Math (formerly Poke and Pull)

Dr. William Leibfritz, Associate Professor, Central Michigan University, Mount Pleasant, Michigan

Mr. Ted Lennox, Teacher of the Visually Impaired, Ferris Carr School, Lincoln Park, Michigan

Mrs. Mary Mitchell, Teacher of the Visually Impaired, Jefferson County Schools, Louisville, Kentucky

Mrs. Margaret Navarro, Teacher of the Visually Impaired, Ferris Carr School, Lincoln Park, Michigan

Mrs. Mary Helen Welsh, Primary Teacher, Kentucky School for the Blind, Louisville, Kentucky

Reach for the Stars

Mrs. Veronica Brown, Louisville, Kentucky

Mrs. Crystal Frame, Cashion, Oklahoma

Dr. Jennifer Grisham-Brown, Assistant Professor, Special Education Department, University of Kentucky, Lexington, KY

Mrs. Diane Haynes, State Coordinator for Kentucky Deaf-Blind Project, University of Kentucky, Lexington, KY

Ms. Nita Kaufman, Assistive Technology, Special Education Department, Lexington, KY

Mrs. Cathy Nelson, University of Utah, Department of Special Education, Salt Lake City, Utah

Mrs. Gigi Newton, Texas School for the Blind and Visually Impaired, Austin, Texas

Mrs. Marianne Riggio, Hilton Perkins Program, Perkins School for the Blind, Watertown, Massachusetts

Mrs. Carolyn Wheeler, University of Kentucky, Lexington, Kentucky

Revision of Patterns: The Primary Braille Reading Program

Mr. Steve Berman, Itinerant Teacher, Northview School, Florissant, Missouri

Ms. Michelle Chabot, Teacher of Visually Impaired, Santee School District, San Diego County, La Mesa, California

Mrs. Frances Mary D'Andrea, Manager of National Initiative on Literacy for American Foundation for the Blind, Atlanta, Georgia

Darcy Kruzinski, Teacher of the Outreach Department, Washington State School for the Blind, Vancouver, Washington

Ms. Nancy Levack, Curriculum Coordinator, Texas School for the Blind and Visually Impaired, Austin, Texas

Ms. Deanna Scoggins, Teacher and Certified Braille Proofreader, Kentucky School for the Blind, Louisville, Kentucky

Sense of Science: Plants

Ms. Melissa Britt-Snow, Teacher of the Visually Impaired, Tift County School System, Tifton, Georgia

Ms. Marcia Gevers, Rehabilitation Teacher, Indiana Blind and Visually Impaired Services, Ft. Wayne, Indiana

Ms. Judith Harrington, Teacher of the Visually Impaired, Crotched Mountain Rehabilitation Center, Greenfield, New Hampshire

Mr. Michael Hayes, Teacher of the Visually Impaired, Belen Consolidated Schools, Vision Related Services, Los Lunas, New Mexico

Ms. Jeanne-Marie Kopecky, Teacher of the Visually Impaired, Idaho School for the Deaf and Blind, Gooding, Idaho

Ms. Christine Pitzer, Rehabilitation Teacher, Indiana Blind and Visually Impaired Services, Clarksville, Indiana

Ms. Tammy Reisman, Itinerant Teacher of the Visually Impaired, Arlington, Massachusetts

Ms. Susan Stokes, Teacher of the Visually Impaired, Lincoln Public Schools, Nebraska.

Ms. Marilyn Walpole, Vision Teacher, Cincinnati Public Schools, Cincinnati, Ohio

Tactile Graphics Videos

Ms. Eleanor Diamond, Braille Transcriber/Tactilist, Montreal Association for the Blind, Montreal, Quebec

Ms. Maria de Rege, Braille Transcriber, Montreal Association for the Blind, Montreal, Quebec

Ms. Marcia Gevers, Rehabilitation Instructor, Indiana Blind and Visually Impaired Services, Fort Wayne, Indiana

Ms. Lucia Hasty, Consultant, Colorado Instructional Materials Resource Center, Colorado Springs, Colorado

Ms. Wanda Pierce, Tactile Designer, Montreal, Quebec

Ms. Dana Star, Teacher of the Visually Impaired, Philip Layton School, Montreal, Quebec

Tactile Word Association

Mrs. Lois Harrell, Project Director, Children's Vision Center, Department of Ophthalmology, University of California at Davis, Sacramento, California

Test and Assessment Needs

Dr. Carol Allman, Program Director, ESE Program Development and Services, Florida Department of Education, Tallahassee, Florida

Mr. Joe D'Ottavio, School Psychologist, Perkins School for the Blind, Watertown, Massachusetts

Dr. E. Eugenie Hartmann, Research Investigator, Vision Research, The Arlene R. Gordon Research Institute, Lighthouse International, New York, New York

Dr. Sandra Lewis, Florida State University, Tallahassee, Florida

Ms. Marnee Loftin, School Psychologist, Austin, Texas

Dr. Mila Truman, Vision Teacher, Tennessee School for the Blind, Nashville, Tennessee

Presentations and Workshops

Bagley, M. (1998, July). People Who are Elderly & Deaf-Blind: An International Perspective. Association for the Education and Rehabilitation of the Blind and Visually Impaired International Conference, Atlanta, GA.

Bagley, M. (1998, July). Aging and Deaf-Blindness. National Federation of the Blind National Convention, Deaf-Blind Division, Dallas, TX.

Bagley, M. (1998, August). Hearing Loss and Effective Communication Strategies. Kentucky School for the Blind, In-service Training, Louisville, KY.

Caton, H., & Pester, E. (1998, March). Braille Readiness and Braille Reading Instruction. Two presentations for the University of Louisville Distance Education Program, Louisville, KY.

Kitchel, J. E. (1998, February). Light and Low Vision. Illinois State Association for the Education and Rehabilitation of the Blind and Visually Impaired, Naperville, Illinois.

Kitchel, J. E. (1998, May). New Products from the American Printing House for the Blind. Illinois State Conference of Rehabilitation Counselors, Teachers and Other Professionals, Moline, Illinois.

Kitchel, J. E. (1998, July). Low Vision: What Can One Person Do? American Printing House for the Blind, Educational Research Department Workshop, Louisville, Kentucky.

Otto, F. (1998, June). Recent Tactile Graphics Products from APH. Kentucky School for the Blind, "Gateways to Independence" Teacher Training, American Printing House for the Blind, Louisville, KY.

Otto, F. (1998, June). An Introduction to the Basic Tactile Anatomy Atlas. Presentation for education students of Middle Tennessee State University, American Printing House for the Blind, Louisville, KY.

Pester, E. (1998, June). The Braille Connection & Math Aids. Kentucky School for the Blind, "Gateways to Independence" Teacher Training, American Printing House for the Blind, Louisville, KY.

Pester, E. (1998, June). Braille Readinesss, Braille Reading and Writing Instruction, and Braille Instruction for the Adventitiously Blind. Workshop at the University of New Orleans Summer Institute for Teachers, New Orleans, LA.

Pester, E. (1998, July). Making the Most of Mainstream Math for the Visually Impaired Student: A Team Approach. Association for the Education and Rehabilitation of the Blind and Visually Impaired International Conference, Atlanta, GA.

Pester, E. (1998, June). New Math Aids. Presentation for education students of Middle Tennessee State University, American Printing House for the Blind, Louisville, KY.

Pester, E., & Gissoni, F. (1998, July). New Projects and Developments with Braille at APH. Presentation at the Braille Revival League, Orlando, FL.

Poppe, K. J. (1997, October). New Products: Tactile Treasures. Annual Meeting of Ex Officio Trustees, Training and Information Symposium Session, American Printing House for the Blind, Louisville, KY.

Poppe, K. J. (1998, June). New Product Demonstration: Tactile Treasures, Score Card Set, and Adapted Version of Brain Quest: Science 1000 Questions and Answers. Presentation for education students of Middle Tennessee State University, American Printing House for the Blind, Louisville, KY.

Poppe, K. J. (1998, July). Tactile Treasures: Math and Language Concepts for Young Children with Visual Impairments. Association for the Education and Rehabilitation of the Blind and Visually Impaired International Conference, Poster Session, Atlanta, GA.

Poppe, K. J., & Otto, F. (1997, October). Using Tactile Pictures with Young Children Annual Meeting of Ex Officio Trustees, Training and Information Symposium Session, American Printing House for the Blind, Louisville, KY.

Skutchan, L., (1998, June). New Talking Products at the American Printing House for the Blind, Career Visions Magazine show airing on ETN, Louisville, KY.

Skutchan, L., (1998, September). Careers as a Blind Person, Kentucky School for the Blind, Louisville, KY.

Willis, D. (1997, October). An Overview of APH's New Product Development Committee. Annual Meeting of Ex Officio Trustees, General Session, American Printing House for the Blind, Louisville, KY.

Willis, D., & Phelps, R. (1997, October). Meet R and D (Robert and Debbie) of APH's Research and Development Section. Annual Meeting of Ex Officio Trustees, Training and Information Symposium Session, American Printing House for the Blind, Louisville, KY

Willis, D., & Glanz, G. (1998, July). New Tactile Graphics Materials from APH. Association for the Education and Rehabilitation of the Blind and Visually Impaired International Conference, Poster Session, Atlanta, GA.

Publications

Bagley, M. (1998, August). From the Field: The First International Meeting on Aging and Deaf-Blindness. Journal of Visual Impairment and Blindness. New York, NY: American Foundation for the Blind.

Elder, V. W. (1997, November). A Reality Check for the "Newbe" Internet User: Internet Related Resources for Students, Parents, and Educators. accessAbilities: Technology for People Who Are Visually Impaired. Louisville, KY: American Printing House for the Blind.

Elder, V. W. (1997, November). accessAbilities: Technology for People Who Are Visually Impaired. Louisville, KY: American Printing House for the Blind.

Elder, V. W. (1997, November). FAMILY FOCUS: Representation for Social Security Claims Now Available On-Line. accessAbilities: Technology for People Who Are Visually Impaired. Louisville, KY: American Printing House for the Blind.

Elder, V. W. (1997, November). Scholarships for College and Grant Resources. accessAbilities: Technology for People Who Are Visually Impaired. Louisville, KY: American Printing House for the Blind.

Hedges, J. K. (1997, November). Windows Access Evolution. accessAbilities: Technology for People Who Are Visually Impaired. Louisville, KY: American Printing House for the Blind.

Otto, F., Poppe, K., & Wright, S. (1997-1998, Winter). Feel the World with Tactile Graphics. CTEVH Journal. San Diego, CA: California Transcribers and Educators of the Visually Handicapped.

Pester, E., & Gordon, B. (1997, Fall). Reading, Writing, and the Role of Technology: The Past, Present, and Future of Education for Blind Children. Proceedings of the Second Biennial Conference of Getting in Touch with Literacy. Alexandria, VA: Association for the Education and Rehabilitation of the Blind and Visually Impaired.

Program Materials

Caton, H., Gordon, B., Pester, E., Roderick, C., & Modaressi, B. (1997). The Braille Connection: A Braille Reading and Writing Program for Former Print Users. Print and Braille Teacher's Edition. Louisville, KY: American Printing House for the Blind.

Caton, H., Gordon, B., Pester, E., Roderick C., & Modaressi, B., (1997). The Braille Connection: A Braille Reading and Writing Program for Former Print Users. Student Practice Books for Grade 1 and Grade 2 Braille. Louisville, KY: American Printing House for the Blind.

Caton, H., Gordon, B., Pester E., Roderick, C., & Modaressi, B. (1997). The Braille Connection: A Braille Reading and Writing Program for Former Print Users. Student Workbooks for Grade 1 and Grade 2 Braille. Louisville, KY: American Printing House for the Blind.

Pester, E. (1998). Hundred Boards and Manipulatives. Louisville, KY: American Printing House for the Blind.

Pester, E. (1998). Card Chart. Louisville, KY: American Printing House for the Blind.

Pester, E. (1997). The Braille Connection: A Braille Reading and Writing Program for Former Print Users. Print and Braille Mentoring Manual. Louisville, KY: American Printing House for the Blind.

Poppe, K. J. (1998). Beginner's Abacus: Instructions for Use. Louisville, KY: American Printing House for the Blind.

Poppe, K. J. (1998). Instruction Sheet for the Score Card Set. Louisville, KY: American Printing House for the Blind.

New Products
August 1997– August 1998

Analog Clock Model
Basic Tactile Anatomy Atlas
  Teacher's Instructional Text (Print)

Beginner's Abacus Kit
  Beginner's Abacus Guidebook (Print)
  Beginner's Abacus Braille Guidebook (Braille)

Braille Connection: Braille Kit
Braille Connection: Print Kit
  Braille Connection Teacher's Edition (Braille)
  Braille Connection Teacher's Edition (Print)
  Braille Connection Mentoring Manual (Braille)
  Braille Connection Mentoring Manual (Print)
  Braille Connection Student Workbook for Grade 1 Braille
  Braille Connection Student Workbook for Grade 2 Braille
  Braille Connection Student Practice Book for Grade 1 Braille
  Braille Connection Student Practice Book for Grade 2 Braille

Brain Quest: Science 1000 Questions and Answers (Large Type Edition)
Brain Quest: Science 1000 Questions and Answers (Large Type/Braille Edition)

Card Chart Kit
  Card Chart and Blank Card Set
    Blank Cards
  Number and Math Signs

ColorTest Device
  ColorTest Instructions (Print)
  ColorTest Instructions (Braille)

Developmental Guidelines for Infants with Visual Impairments: A Manual for Early Intervention (Print)

Hands-On Experience with the Cranmer Abacus (Video)

Hundred Boards and Manipulatives
  Number Set for Hundred Boards

Magni-Cam™

Money Handling and Budgeting, (Braille Edition)
Complete Adapted Practice Checkbook
Bound Practice Checks/Deposit Tickets

Patterns Library Series: Preprimer Level (Print Edition)

Preschool Activity Calendar (Print)

Print/Braille Protractor

Program to Develop Efficiency in Visual Functioning: Addendum

Score Card Set

Stanford Achievement Test, Ninth Edition, Print Directions for Administering the Large Type Edition, Form S, Complete Battery/Multiple Choice, Primary 2

Stanford Achievement Test, Ninth Edition, Print Directions for Administering the Large Type Edition, Form S, Complete Battery/Multiple Choice, Primary 3

Stanford Achievement Test, Ninth Edition, Print Directions for Administering the Large Type Edition, Form S, Complete Battery/Multiple Choice, Intermediate 1

Stanford Achievement Test, Ninth Edition, Print Directions for Administering the Large Type Edition, Form S, Complete Battery/Multiple Choice, Intermediate 2

Stanford Achievement Test, Ninth Edition, Print Directions for Administering the Large Type Edition, Form S, Complete Battery/Multiple Choice, Intermediate 3

Stanford Achievement Test, Ninth Edition, Print Directions for Administering the Large Type Edition, Form S, Complete Battery/Multiple Choice, Advanced 1

Stanford Achievement Test, Ninth Edition, Print Directions for Administering the Large Type Edition, Form S, Complete Battery/Multiple Choice, Advanced 2

Stanford Achievement Test, Ninth Edition, Print Directions for Administering the Large Type Edition, Form S, Complete Battery/Multiple Choice, Task 1, 2, 3

Transition Tote: Student Kit (Braille Version)
Transition Tote: Student Kit (Cassette Tape Version)
Transition Tote: Information Supplement (Braille Version)
Transition Video: Navigating the Rapids of Life